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Rail-Road News.

New York and Erie Railroad.

By the Report for 1850, of Mr. N. Marsh, the Secretary of this Company, we learn that about 405 miles of the road is now in use, and that it will all be completed to Dunkirk, on Lake Erie, about the 14th of next May. This railroad is the greatest private enterprise in our country. The whole cost of equipments, buildings, &c., will be, when the road is finished, about twenty and a half millions of dollars, and the cost about $38,706 per mile—not counting the machinery and building. This is an enormous sum, but the expense of construction is very moderate, considering the difficulties of the work, and the manner in which it has been performed. The earnings for the year 1850 have been $1,600,300, or $5,000 per mile; in 1849 they were only $3,697 per mile. This is a great increase, but nothing to what it will be when the road is finished throughout. This road runs through some of the grandest mountain scenery in our country. The bridges, cuttings, and gradings are works of great magnitude, but are all of the most substantial and enduring character. The most able engineers and architects have been and are now employed by the Company. This road is of a wider track than the common roads in our country, and to see one of the large locomotives that are used on it come rushing onward, it makes the "boldest hold his breath for a time." When completed, there will be an unbroken line of wide track 543 miles long, and at the rate of 30 miles per hour, a traveller will be able to reach Erie from New York in 18 hours.

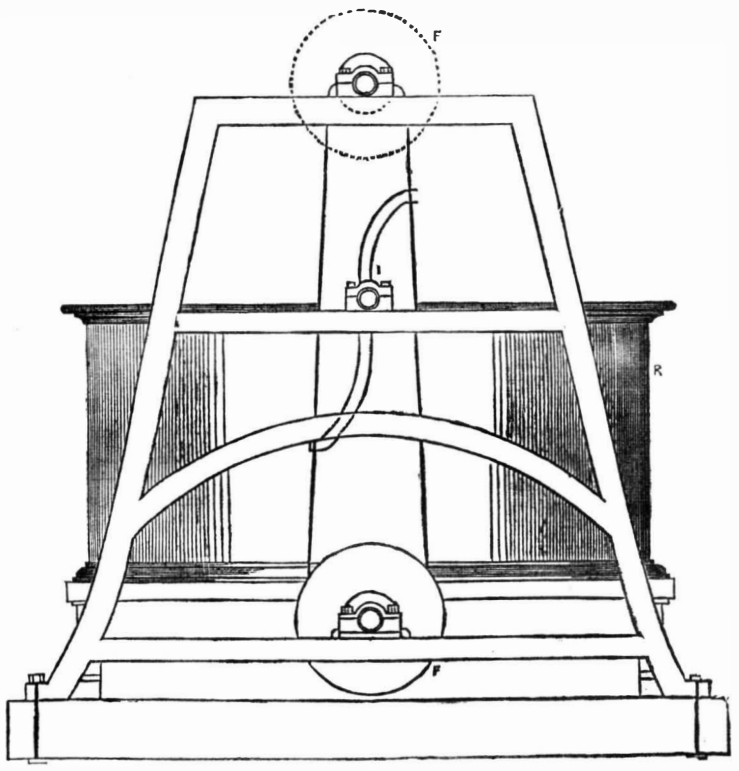
New Arrangement between the New York and Erie Railroad.

The arrangement between the Erie and Ramapo and Paterson Railroads for transporting the passengers of the former to Jersey City, instead of Piermont, as heretofore, went into operation last week. A ferryboat is to ply between Jersey City and Duane street pier, N. Y., by which passengers arrive and depart at that point. The express trains leave at 7 A. M. and 5 P. M., the former period of starting, but passengers arrive at their destinations some hours earlier than by the Piermont route. The Erie road is finished to Cuba, a distance of 45 miles from its present terminus, and will be opened sometime next week—making a continuous line of road over 380 miles, and it is thought the whole line will be finished by the 1st May next. The citizens of Rockland County, New York, have published a protest against this arrangement.

Wheeling Bridge.

Chancellor Walworth recommends the elevation of Wheeling bridge twenty-eight feet. This is considered a final disposal of the Wheeling Bridge case, and is equivalent to its coming down.

BIRKETT'S IMPROVEMENT IN SUGAR REFINING MACHINERY.---Figure 1.



The improvements embraced in this invention have been made by Mr. J. Birkett, of 180 Essex street, this city. Figure 1 is an end view; figure 2 is a vertical section, showing the inside of the revolving sugar case. Figure 3 is a plan view. The same letters refer to like parts. Mr. Birkett claims it as a valuable improvement on the English Liquid Extractor, requiring no more than one-fourth of the power to drive it that is required by other machines which have been used for the same purpose, and it can be applied to the drying of wet goods, either silk, cotton, or woollen. The machine is a centrifugal one; in other words, the matter from which the moisture is extracted receives a rapid rotary motion, which throws the moist particles off by centrifugal force, from the more thick and weighty matters. A is an interior cylinder; it is made of perforated sheet copper or strong galvanized wire, with an inner lining of fine brass; B is a traction pulley made fast on the inner end of the line shaft, C. D is a sliding pedestal, which can be raised or lowered by the lever, E. When raised this brings it to bear on the bottom of the cylinder, A, thus answering the same purpose as a pulley. When the line shaft, C, is put in motion, it turns the inner cylinder round in its top and bottom bearings, and it can be driven at the rate of from two to three thousand revolutions per minute. Any substance, such as moist brown sugar mixed with molasses, placed in the inside cylinder, by its rapidity causes the moisture to pass through the wire gauze, and the sugar is retained inside, white and dry. The sugar is thrown against the gauze, and the moisture gets through it to the outside, where it is carried away by a spout. G is the driving shaft, with a fast pulley on the end of it; F F are cone pulleys, the one placed on the line shaft, C, and the other on the driving shaft, G. I is a belt guide, and H is a screw for driving it backwards and forwards; K K are a pair of small friction pulleys placed on the line shaft, C, and L is a small upright with a bevel gearing at the top, and a friction pulley at the bottom; M is a small sliding pedestal, which moves the upright shaft backwards and forwards against either the one or the other friction pulleys, K K; this gives the right and left hand motion to the screw for moving the belt on the cone pulleys. When the belt is straight it commences running from the small end of the top cone, and is fed forwards by the screw increasing in speed, until it attains to the small end of the lower cone, where it attains the maximum of velocity, and then the bar on the belt shifter strikes the projecting arm, of the lever, X, which shifts the friction pulley on the bottom of shaft L, making it come in contact with the opposite bevel, K, which reverses the motion of the screw, H, and slides along the belt on the cones. By this method of gearing the speed is got up gradually and let down in the same way—the only sure method of working. N is a friction clamp with hard wood steps, which, when pressed together by its lever, acts upon the wood steps or bearings of the cylinder shaft, thereby retarding, graduating, and arresting its velocity by friction. This oftentimes will save a great deal of time. O is an iron flange with a brace across the middle to support the pedestal, which is fastened on the top of the outside cylinder, R, by three bolts; this allows the inner cylinder to be taken out at any moment for cleaning or otherwise. P, fig. 3, is a pair of loose covers which fit on the top of the flange, O; the small holes are for the purpose of having small covers on them, or they can be used for pipes to admit hot atmospheric air into the inner cylinder, it being drawn in by the vacuum formed at the centre of the cylinder by the centrifugal motion of the cylinder. The hot air assists in the extraction of the moisture and greatly facilitates the operation in respect to the saving of time. Q is a pipe in the centre cylinder, R, to carry off the liquid extracted from the sugar. One of these machines may be connected at each end of the line shaft. This machine is well adapted for our southern planters. It can be worked easily by horse-power, as well as by steam and water power.

More information may be obtained by letter addressed to Mr. Birkett.

Figure 2.

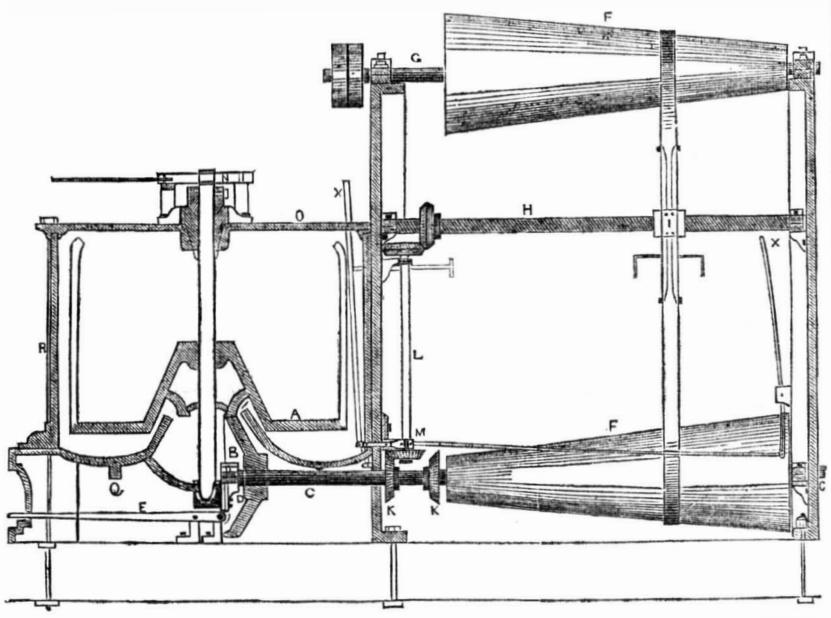
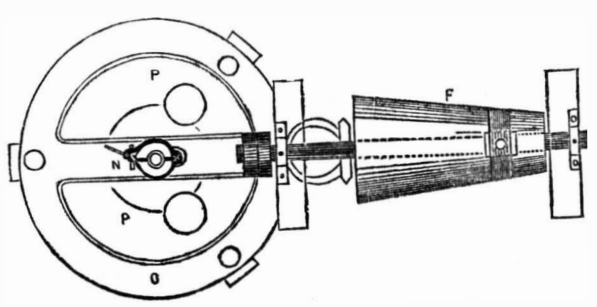


Figure 3.



A work has appeared by Mr. Getty, on a discovery made during the last century, of a number of Chinese seals which were found in Ireland. They have been found in various parts of the island, are made of porcelain, and represent a monkey sitting on a cube. Very ancient Chinese characters are engraved upon them. They have long puzzled the learned men of the world.

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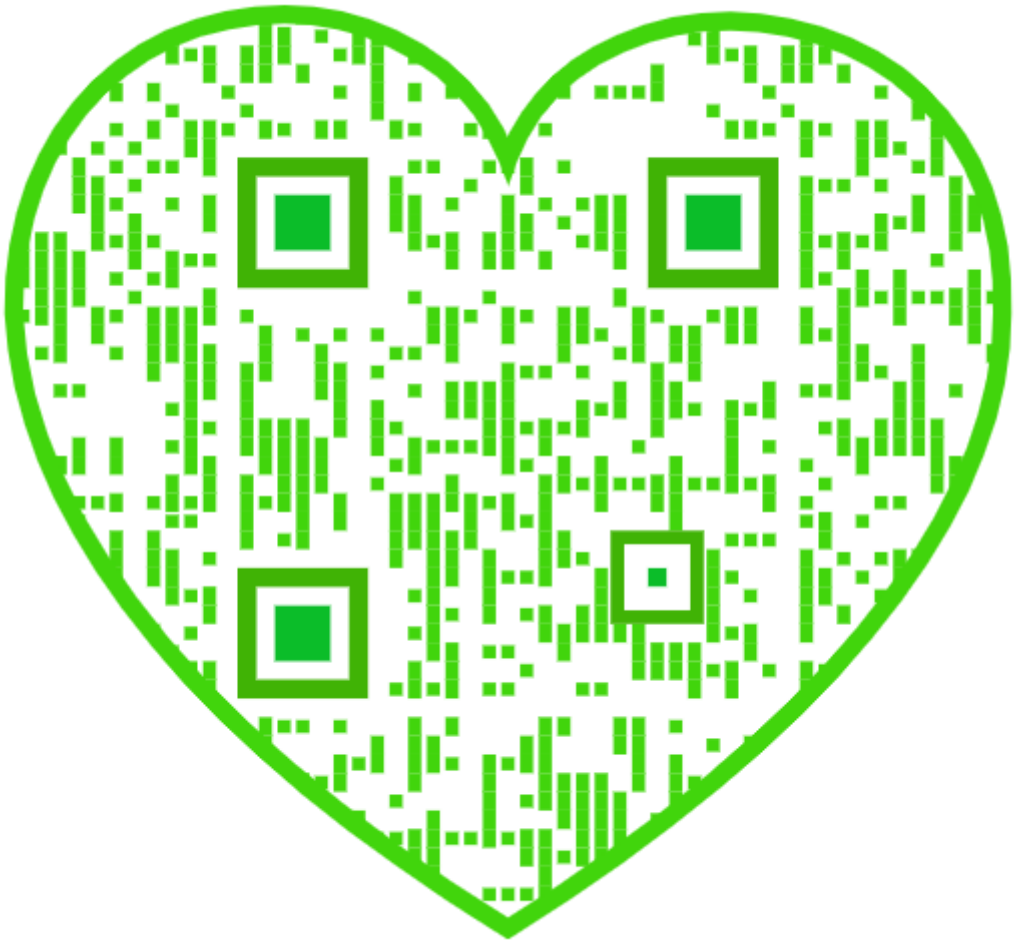

Miscellaneous.

Foreign Correspondence.

LONDON, 5th Feb., 1851.

The great Crystal Palace, as the building for the World's Industrial Exhibition hasbeen termed, is now nearly finished, and although not quite complete, it has been open for visitors for some time. . The price for admission has been about $1,25—a large fee, indeed; none but the higher classes have been able to avail themselves of its provisions, nor was it intended for any body else. This is right in one respect, but not in another; those who can pay, and are willing to do so, it is no harm to allow them an opportunity for that purpose. Another good thing is the purpose for which this money is set apart viz., charitable purposes, and for rewarding the merited efforts of the industrious. Some scientific men have objected to the building as erected, on the ground of a want of strength: among the number is Prof. Airy, the Astronomer Royal, a man of great mechanical knowledge. His fears, it seems, have been dissipated by the Commissioners appointed to examine the building and report on the same. To look upon it, in all its vast extent and fairy-like fragility, a feeling of insecurity respecting its strength, is natural, but we have been so accustomed to witness large strutures, having giant pillars of stone for supports, that we are ready to forget the superior strength of iron, of which this building is mainly composed.

It is calculated that 20,000 persons will be easily accommodated in the building after all the articles for exhibition are arranged. This is a great number, but it is not too large. No one can form a true idea of the vast structure without looking upon it; it is a work which has never had a parallel in any age or country. A few months ago all the materials of which it is made were lying upon the ground in the form of unshapen, hard rocks; they have been submitted to the moulder's crucible, and are now standing in grandeur and in beauty, forming a structure unique and unlike anything ever erected by man since the world began. On the 30th of last month, during a very high wind, and such winds are very common here, part of the roof was suddenly displaced; this created an uneasy feeling about its insecurity, but it was ascertained that the cause of this was owing to a neglected piece of work. A great deal of the inside work will not be finished until the machinery is placed and the heavy articles properly arranged.

There is one point not yet definitely settled by the Commissioner's of the Exhibition—this is the scale of prices. Exhibitors, and those who are agents of exhibitors, together with the members of the public press, will be allowed free admission, but it is doubtful if at any time it will be thrown open free to the public. I think that a fee of about 1s. (25 cents) will be the lowest charged, and this will not come into effect for some time; not at least until the nobility and more wealthy classes have seen the whole in operation, and the fee for them will likely be about three or four dollars.

I suppose I may expect a good representation of American skill and genius displayed. France will no doubt stand very high in the scale of national exhibitors. The taste and skill of the French are proverbial.

Strong efforts are now making to obtain a reform of the British Patent Laws: it is high time they were reformed. I hope the present Parliament will reform them, and that before the Exhibition is opened. No man can expose an unpatented invention and feel safe, as the mere exposure of it publicly would invalidate the patent, if the said patent was subsequently secured. No poor man can obtain a patent in England; if a working man invents the most meritorious and useful machine, or makes one of the most important discoveries, he must get a man of wealth to assist in securing a patent, for assuredly he cannot do so himself, the fees being from $700 to $2,000 for the United Kingdom and the Colonies. A simplification of the mode of obtaining patents is demanded, and a reduction of the fees to about $130. I hope these reforms will be carried through so that justice may be done by the Patent Laws of the British realm to the poor inventor, as well as the rich. The journals devoted to the interests of inventors here, advocate a new law—a mixture of the American and the French codes. They say,—Don't let us have the American Patent Office, espionage system, by which so much injustice is done to applicants. The London Patent Journal, in quoting an article from the Scientific American about a reform of the English Patent Laws, wherein the American system is recommended to the attention of the British, says, "we like free trade in patents as in other things, but we do not want the practice of the Americans in passing judgment in the Patent Office upon applications." An improvement of the Patent Law recommended, is, that a patent be granted for 21 years, that $25 be paid down when granted, and $35 every year afterwards, until the term expires, unless it is found unprofitable, when the patentee can let it expire just by not paying his yearly tax. I think this is a good plan, and is well worthy of your attention in America. It is derived from the French system, where the government prosecutes for infringement.

I will endeavor to give you information regularly, respecting all matters connected with the World's Fair. EXCELSIOR.

Growth of Shade Trees.

A venerable octagenarian now residing in Brooklyn, when 15 years of age, planted four elms, less than 3 in. in diameter, before the dwelling of his father, in the beautiful village of Stockbridge, Mass. He has recently made enquiries respecting them; and learns from their present owner, that they measure 9 feet 10½ in. in circumference, 6 feet from the ground. That they spread over a circle 50 feet in diameter, and rise 68 feet in length as near as can be ascertained, affording a delightful shade, greatly increasing the value and beauty of the property, and being highly ornamental to the place. Who would not by a similar forethought and trifling labor, thus provide for the pleasure and happiness of generations yet to come. This gives a growth of over ½ an inch per annum in the diameter of trees, and a fact beyond dispute worth noting. W.

(For the Scientific American.)

Spontaneous Combustion in Cotton.

I see in Arthur's Home Gazette that the Board of Underwriters in New York wish to ascertain, by chemical tests, "is cotton subject to spontaneous combustion?" I do not know whether it is a hoax or not, but you may tell them to take a small lock of cotton, say from ¼ to ½ oz. and saturate it well with well-boiled linseed oil, such as painters commonly use, squeeze all the superabundant oil from it, and lay it in the sun, in a hot day, and it will take fire by spontaneous combustion in twenty minutes,—in the shade it may be two or three hours. I have tried it many times, to gratify the curious and convince the skeptical. The cotton must be pressed together as compact as can well be done in the hand, and must not be disturbed by loosening it after you saturate it. It is nothing new under the sun that cotton or hemp will take fire by being saturated with oil, but that it should ignite so quick is what has astonished me. Some kinds of boiled oil will cause the cotton to ignite much quicker than others, owing, I suppose, to the dryers used in boiling. I do not know what was put into the oil, when boiled, which I have experimented with, as it came from New York ready boiled for use. A. D. BROWN.

Clinton, Ga., Feb. 16, 1851.

[We have known of many such cases as that described by our correspondent. In preparing cotton goods for what is termed the "Adrianople Red," a great deal of olive oil is used, and there are hundreds of cases on record where such goods have ignited spontaneously when piled up in heaps. It is Bertholett, we believe, who treats this subject somewhat extensively. Great care should be exercised by those who are packing cotton, so as not to allow grease and oil to get among it.

Ground Pumpkins and Good Brooms.

The above caption may seem rather quaint to some, but nevertheless implies the whole meaning of this little article better than any other title which suggested itself.

Ground dried pumpkins is an article of merchandise, prepared by the United Society of Shakers, at Harvard, Mass., and is the best substitute for the pumpkin "yellow and ripe from the field," that we know of. Good pumpkin pies may be made at all seasons of the year, by obtaining the pumpkin ingredient as above, and following the annexed direction for use:—

To one pound of pumpkin, add 12 quarts of milk and one egg to each pie. Stir the pumpkin with the milk, set it in boiling water from 20 to 30 minutes, then add more eggs, sweetening, spice, &c., to suit the taste.

Pies thus made will have the delicate appearance of squash with the flavor of the pumpkin. Crackers and water may be used as a substitute for milk, when milk cannot be had.

We have been favored by the Harvard Society of Shakers, through one of their members, Mr. E. Myrick, with a sample of brooms for which they will please accept the Editor's thanks. Any one wishing good New England pumpkin pies at any season of the year, and a good broom to sweep the kitchen which will not disconnect from the handle, had better send orders to the care of Mr. E. Myrick, addressed to South Groton, Mass., and we will guarantee they will not be disappointed in either article when received.

Paine's Light in Britain---A Mistake.

In a communication to our worthy cotemporary, the London Mechanics' Magazine, of Feb. 1st., Mr. S. L. Freemont has made a mistake in attributing to the Editor of the Scientific American any doubt about water being less than a compound body. The editor has never expressed himself in such a manner as to convey any other idea than he believed water was a protoxyde of hydrogen. Mr. Freemont entertains the same views exactly as we do.

Paine's Light is creating quite a sensation in England—a patent has been taken out there for it, and one applied for recently at Washington. Our cotemporary, the London Patent Jour. of Feb. 8th, has a correspondent signing himself "C," who makes some very excellent remarks on the subject. He says, "a bright white light is very deceptive as to its illuminating power when judged of merely by its appearance. He discovered this by examining the electric light displayed in London. He also states that from all evidence yet adduced, (and the letter of Dr. Colton, and the articles of Mr. Wright, have been re-printed in England), nothing has appeared to overthrow the report of the Scientific Committee who investigated the subject.

Queenston Suspension Bridge.

This second structure which spans Niagara River has recently been opened to the public. The towers are built on each side, and it is 1,043 feet from tower to tower. There are to be ten cables in all, each cable made of 250 wires; each wire warranted to bear 1,500 pounds. The cables are firmly anchored in the rock, and pass over two massy stone towers some 14 feet high. The cables, when extended, have the shape of a rainbow turned upside down. Instead of the planking and pathway being over the cables, it is under them, and the work to be sustained by iron rods suspended from the cables. The planking to be 20 feet wide, intended at present for teams. It is said to be the greatest suspension bridge in the world.

[The Wheeling Bridge is 1,010 feet from centre to centre of the towers. The strands of wire used are No. 10, capable of sustaining the amount of pounds stated above. Mr. Ellett used 550 strands in each cable. The Niagara Bridge uses more than a half less (6-11) number of strands. The ten cables will, therefore, support only 1,625 tons, less the weight of the structure. The Wheeling Bridge is capable of supporting 4,950 tons, less the weight of the structure. We suppose there is a mistake somewhere, as the Queenston Bridge should be built stronger.

Choice Receipt for Dyeing.

SCARLET.—Dip the cloth in a solution of alkaline or metallic salt, then in a cochineal dye and let it remain sometime, and it will come out permanently colored. Another method. Half a pound of madder, half an ounce of cream tartar, one ounce of marine acid, to a pound of cloth. Put it altogether and bring the dye to a scalding heat. Put in your materials and they will be colored in ten minutes.

The dye must be scalding hot. Rinse your goods in cold water as soon as they come from the dye.

[We copy the above from an exchange, in order to point out the errors, for assuredly they are very great. It is stated above that the cloth should "be dipped into a solution of alkaline or metallic salts." This is wrong; if the cloth were dipped into a solution of common salt, it would not answer. Metallic and alkaline salts are entirely different. To dye a good scarlet, let the cloth be well cleansed from all grease and dirt, and put into a tin or clean copper vessel as much clean water as will cover the cloth well. Put in one ounce of ground cochineal for every pound of cloth, and boil it five minutes, then add a wine glass full of the chloride of tin, one ounce of cream of tartar for every ounce of cochineal, stir all up, and enter the cloth all as free and loose as possible; boil for one hour, and a beautiful scarlet is the result. After this, rinse the cloth in clean cold water and dry in a warm place.

The Atlantic and Arctic.

At a meeting of the Architectural and Archæological Society on Wednesday, the Chairman, Mr. Frank Howard, asked whether the breaking down of the Atlantic had anything to do with the peculiarly polished and steel-like appearance of the machinery observed by Mr. Arthur Holme? Mr. Horner observed, that Mr. Holmes' remarks applied to the Arctic. There was a great difference between the engines of those boats. The Arctic had the most highly finished engines that had come from the other side of the Atlantic.—[Liverpool Times.

The Baltic.

This noble steamship arrived at her wharf on Thursday last week, taking all our citizens by surprise, by her quick passage of only twelve days from Liverpool. A writer in the Tribune, signed Philopanti, made the Baltic quite inferior to the Asia. Another signing himself Practice made out Philopanti to be quite ignorant of the facts in the case. As we have already stated, this shows there is an amount of ignorance all round about on the subject.

Gold Solutions.

There are three solvents of gold, aqua-regia, or nitro-hydro-chloric acid, aqueous chlorine, and a mixture of the chromic and hydrochloric acids; this last mixture, as well as chlorine, is inconvenient and uncertain, but the nitro-muriatic acid dissolves it very readily, forming with water a solution of almost the only salt of gold, though the metal unites with several of the elements,—oxygen, bromaine, iodine, &c.

Æthereal Solution of Gold.

To the above solution add sulphuric ether, this will separate the gold from the acid, and the ether holding the gold in solution will float upon the surface of the acid, from which it may be poured off, and kept for use in a dark place or an opaque bottle, it being decomposed by light.

Macadam in Paris.

The mud produced on the macadamised part of the Boulevards is (says the *Moniteur du Soir*) to be turned to account. A person, named Taboureau, has obtained permission to carry it away for the purpose, after having had it carefully washed and sifted, of having the silicious particles made into bricks to clean knives with. A hectolitre of the mud produces ten bricks, which are sold at 20c. each, and so give 2f. for each hectolitre. It is said that a good workman can earn 20f. a-day by this new kind of industry.

The Hudson River is now open to Albany, and the steamboats are soon to go up.

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Ship Builders and Ship Building.

The following is the letter in Mr. Griffiths' work, and to which reference was made in his communication in last number of the Scientific American:

Mr. J. W. Griffiths—I am truly gratified to know of your intention of publishing a treatise on the subject of Naval Architecture. It is a work much needed. Your labors in this cause already merit the thanks of the profession, and I trust that your present undertaking, as it deserves well, so will it fare well at their hands, and of the public generally, whose safety and interests are so deeply involved in everything which has for its object the promoting of scientific knowledge in relation to this subject.

I suppose that there is no class of mechanics in the world who have labored under such disadvantages in the practice of their profession as ship-builders. Although ship-building, as a practical art, has been in existence for thousands of years, yet, as a matter of science, little or nothing has been done in its favor until quite lately. It is still true, that, with the exception of those conflicting rules of tonnage, and that ill-advised dictation of owners, by which he is hampered and vexed, rather than assisted, each individual modeller has little else besides his own taste and eye to guide him. That the subject is capable of being brought under more general rules, like other departments of mechanics—in other words, that the subject of Naval Architecture may be made a science as well as an art, no builder of experience has the least doubt. And ship-building can never be on a par with other practical professions until such is the case.

Doubtless here, as in other departments, practical men ought to look for a certain degree of information from the labors and studies of scientific men. The general laws of the resistance of bodies in fluids; the laws of motion; of the application of forces; the laws of gravity and dynamics, are fixed laws of nature, and should be as familiar to the ship-builder as the laws of heat and steam to the steam-engine builder. They should, indeed, be especially familiar to him, from the very fact that the conditions and circumstances of their application, in this case, are so variable—almost infinitely so. This it is that makes the problem of modelling so uncommonly difficult. The question, in each particular case, is involved (besides the preliminary conditions) with so many possible accidents, altogether beyond the builder's control, and which must, nevertheless, come into the consideration of his model. When a mechanic builds a steam-engine, a sugar or a cotton factory, as soon as his work is put up it is fixed and done. But when a builder launches a ship, it is entirely different; the thing is to be both at rest and in motion, liable to a thousand varying circumstances. His vessel is required to be strong, to be swift, to be capacious; to act well in sudden and rough weather, as well as in smooth; and to act well also upon the possible and often actual conditions of misplaced weight, loss of spars, and mismanagement or incapacity of those in whose hands she is. In addition to all this, she is often required to be previously modelled, in accordance with the fancy of some conceited owner, who, having made, perhaps, a single voyage in a ship—and perhaps not even that,—thinks he knows more than all the builders in the world, and becomes ambitious of having his ships pass for his own, not only as owner but as inventor and builder also. Then, too, the ship-builder is not always at liberty to carry out his own idea as regards the sparring; but after submitting his list of spars, is often put to the mortifying necessity of making changes, which he knows must injure the action of the ship. Thus, not only his general art, but his individual reputation, is at the mercy of those who have no more than a mere smattering of knowledge. Of those who, while they think they know everything, are, in reality, so unskilled and ignorant as to be unable to detect differences in a model sufficient to alter the character of a vessel.

It is not ship-merchants, nor is it always ship-captains, that are possessed of that cultivation of the eye which is necessary in order to pass judgment at a glance, upon the merits of any particular model. This is a thing which is only to be acquired by the practice, not of *looking at*, or being ever so conversant in other respects with a ship, but of *making* ships. It may be safely said that his judgment of a model is not worth much, who cannot make a model. And those who are so unwise as to think they are qualified to control the mind of a builder in these respects, should learn to be modest enough to admit the truth of the above observation. They would find it vastly to their interest to do so. We shall never generally get first-rate vessels until owners and others shall be willing to remain in their own departments, and give builders the credit of being sufficiently informed in theirs. Let them give us the size, that is, the capacity, and the object of the vessel they wish to contract for, and then let us alone. This is all we ask, and we will pledge ourselves hereafter to give them better ships, without their assistance, than has hitherto been done with it; and the result will very quickly show it to be so.

It appears to me, therefore, that the main thing to be done in order to promote the science of ship-building, is to get rid of those unnecessary restraints which have been heretofore cramping the labors of builders, and preventing them from carrying out their own ideas in the practice of their profession. In the first place I would advise the advocacy, by your treatise, of an International tonnage law. Let the rule of measurement be that which takes in the actual capacity of the vessel. This is the only sensible rule, and the only one which will leave modelling free. How perfectly absurd is it, that a builder should, at this day, be subjected to a rule of tonnage measurement, which, if he were to follow it, would require the general proportions of his vessel to be the same that were in vessels at the time of Cromwell!

In the next place, let builders be left free of the fancies and conceits of owners and others. Let them be supposed to know their own business best, and have no other requirements except the general terms of the contract to hamper them. Then would they be on a par with other mechanics, to make observations, and to adopt the results of experience. I have said that the builders are to look to the labors of science for assistance. In many respects they are, but by no means to the same extent as other practical men. All science depends upon experiment; but the only *adequate* experimenters in this matter, are the builders themselves, together with the assistance which they derive from captains and sailors. It is not in the power of an experimenter, with cut blocks in a pond of smooth water, and with artificially applied forces, to determine the best model for a given end. It is a very easy thing to build an ideal ship that shall be perfect; but to build a ship to go to sea, and carry cargo, and be exposed to the accidents of shore and ocean, is a very different thing. Scientific experiments upon land, of the kind mentioned, are certainly in their place, and have helped us to decide many important questions, and properly conducted will help us to decide more. But still the only adequate experimenters in ship-building are those who make and sail ships. The only sufficient elements in the experiment are with the ships themselves; and the only fair scene of experiment is the ocean upon which those ships are to sail, and to whose accidents they are liable. The great thing to be accomplished is, that ship-builders should be left free as possible to observe those experiments, learn from the results of them, and apply that knowledge to each successive model. Then will the art of building be, at the same time, the science of building; and then will the interests not only of individuals, and of the nation, but the safety and prosperity of men, generally, be promoted to a degree not easily calculated.

Concerning my views on sparring, for which you inquire, I am prepared at present only to say, that while I have some views on that subject which I have never yet been at liberty to carry fully into practice, I have not had that opportunity for experiment and reflection which would warrant me in expressing, at this time, those points in which I should vary at all from the common practice.

With the best wishes for the success of your present undertaking, I remain, yours,

David Brown.

(For the Scientific American.)

Sea Steamers.

Your paper, Messrs. Editors, is my constant companion, as it should be that of all those who indulge in speculative thoughts on the useful arts or sciences, because it is the focal point, or ought to be, and probably will be, at which all new projects should meet, be they practicable or not; for there they will be subjected to a severe and profitable ordeal. Indeed, is it not desirable that a grand centre should be established for the meeting of the rays of science from all the civilized nations of the earth, from whence they would be reflected back, improved by a judicious collation of the whole mass? Is not the grand Exhibition about to take place in London somewhat of this character?

Projects, practicable or not, may be useful,—first, if devoid of a philosophical basis, as beacons to warn the ignorant; then, if pursued in the right path, as indicators of something new, and useful, and possible. In this view, when Alexander Everett went on his mission to China, I gave him a commission, which he would have attended to if he had lived: it was to look into the various processes—mechanical and chemical—of that very ancient nation, to see whether any of them originated in *different principles* from our work for the same purpose, regardless of greater or less perfection in the instruments or the execution. My idea was, that if any radical difference were discovered, we, with our greater fund of knowledge and experience, might use to advantage principles which they have allowed to lie dormant and without improvement. I have since given the same commission to Captain Forbes, now in China, an enterprising gentleman, better able, perhaps, from his mechanical taste, to do justice to the commission.

The object of this communication is to call the attention of the speculators on steam navigation to the increasing difficulty of welding the shafts, and some other heavy parts of steam engines, which must increase with the dimensions of the ships. Some instruction on this subject might be had from an examination of the broken shaft of the Atlantic. Sixty years ago I saw, in a Spanish arsenal, a broken anchor of one of their largest ships, (the Salvador del Mundo, I believe), in the centre of which there were loose bars of unwelded iron. Now the shafts of our steamers are much larger than the largest anchors, and may there not be difficulties not easily overcome in welding such masses? And even if welded to their centres, may not the welding or cooling be unequal and defective? May not, indeed, the over-heating necessary for the purpose, injure the tenacity of the iron, and assimilate it to cast iron? I have no practical knowledge on this subject, and merely suggest these notions for the consideration of others who have. If it should be found by experience that a good welding cannot be had beyond certain dimensions, we must then find some other expedient, such as coupling parts together and hooping, as with large masts; or, finally, by reducing the machinery and multiplying the wheels of the steamers. If this last mode of making large shafts should be thought of, there appears to be one circumstance in its favor, and that is, so much of the iron as is contained in the hoops will give its strength in the most favorable form, viz., longitudinally. The idea of four wheels to the projected large and long steamers is suggested on another ground; it is that which gives some advantage to a wagon over a cart. When one of the cart wheels meets an obstacle, one half of the whole load is to be raised; whereas, when one of the wheels of a wagon meets a similar obstruction, but one quarter of the whole load is to be raised; and there are three chances that one or more of the other wheels may de descending from an obstacle overcome at the same time, or may be on a plain. Speculations on *true* analogies are legitimate, but as there is between immovable land and movable water a great difference, and other discrepancies which may occur to experienced mariners,—experience alone must be had to test this question. My only object is to incite bold speculation on this important subject.

Many years ago I witnessed in France some of Fulton's experiments, and believe that full justice has never yet been done to that great inventor; I may allude to the cases at another time. W. F.

Boston, 19th Feb. 1851.

[We will publish, next week, an illustrated description of Nasmyth's system of Forging; it was brought before the notice of the last meeting of the "British Association." We intended to publish it before, and are glad that our correspondent recalled the subject to our memory.—[Ed.

Improvement in the Manufacture of Starch.

By our worthy contemporary, the London Patent Journal, we learn that Mr. James Colman, of Stoke, Norfolk Co., England, has recently taken out a patent for a new improvement in the manufacture of fine starch, which appears to be of no inconsiderable importance. The following is an extract from the published specification:—

Take one ton of rice, either whole or broken, with or without the husk, and submit it to the action of caustic alkaline ley, in the manner at present performed, using soda in preference to potash, as affording a less deliquescent product. Wash the rice so prepared, and then pass it through the grinding or levigating mills in the usual manner, so as to reduce the starchy matter to a pulp, in a fine state of division. The washed pulp so obtained is next to be placed in a churn, together with 40 gallons of a solution prepared in the following manner:—Take 20 lbs. of borax, and dissolve it in such a quantity of hot or cold water as will suffice to form a cold saturated solution; for which purpose about 20 parts of water are requisite for 1 part of borax; pour 40 gallons of clear solution of borax thus made on a bushel of unslacked lime, placed in any suitable vessel; stir the mixture, and add to it enough water to make up the quantity used to 50 gallons. Allow the undissolved portions in the mixture to precipitate, draw off the clear supernatural solution, and place it in the churn with the starch pulp, prepared in the manner before mentioned. The contents of the churn are next to be subjected to agitation for two or three hours, so as to bring each particle of the starchy matter in communication with the alkaline solution. When the desired effect has been produced, the mixture is to be run from the churn into the separating vessel, and about as much water as the churn will hold added to it, (dimensions or capacity of churn not given); the whole is to be now well stirred, and the starch washed, boxed, and dried in the usual way. Instead of borax and lime, as above mentioned, the same quantity of solution of borax alone may be used, or a solution of bitartrate of potash and lime, or a solution of bitartrate of potash alone may be employed. In either case, the process is to be conducted as above described. In the case of any other farinaceous or liguminous substance than rice being employed, the material used must be reduced to a fine pulpy state, as in the case of rice, proceeding as above directed.

California Gold.

By the latest news from California, we learn that the golden prospects are brighter than ever. A new gold region, it seems, has been discovered at a place called Klamath, on the sea shore, where, along a whole beach twenty-seven miles in length, gold has been discovered in great quantities, mixed with black sand. There is a range of rocks behind the beach, called Gold Bluffs. It is stated that one pound of the sand contains about $1,25 of gold.

It is estimated from official and other sources, that the immigration to the United States, during the last two years, with a view to permanent settlement on our territory, approximates to the enormous amount of 650,000 souls.

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New Inventions.

Barlow's Planing Machine.

There has been running for some time, at No. 27, Bethune street, this city, a machine for planing and matching boards, invented by N. Barlow, of St. Louis, Mo. We visited it on last Thursday to see it operate, and before it commenced working, we must say that we had a very unfavorable impression respecting its qualities. It has some peculiarities about it, which are decidedly good. It is not a rotary cutting machine, as neither the cylinder, nor disc cutter wheels are employed. Neither does it employ stationary cutters. The boards are fed in upon edge, between feeding rollers, and they run between the planing knives, which are a series of planes, set on both sides, the boards running in between them. They act upon the board or plank on both sides to take it down to a proper thinness. One set of planes has a fixed face plate, the other on the opposite side has a yielding face plate to accommodate itself to inequalities of the board. So far, it may be said, there is not much about it different from some stationary planing cutters; but the planes have a reciprocating motion, up and down worked by connecting rods, having eccentrics, and this gives a slanting cut transversely to the motion of the board. This is a most valuable principle of operation; the action is easy, and the difference between it and a stationary cutter can be easily explained by trying to cut a slice of bread from a loaf by giving the knife a slanting sawing motion, and not moving it all. It sends the boards through it faster, and with greater ease than any machine we ever saw in operation. The tongueing and grooving is done by stationary cutters of a peculiar form. We intend to present an engraving of the machine in a short time. Its principle of action is new and it has been admired by all who have seen it operate.

Improvements in Cotton Spinning Machinery.

Mr. W. Rouse, of Taunton, Mass., for whom we recently had the pleasure of securing a patent in spinning machinery, has made two other valuable improvements, for which he has taken measures to secure a patent. The improvements consist in regulating the draught of the thread between the ring guide and the traveller of the bobbin; and an improved method of letting the ring rail descend suddenly to lay the binding thread on the cope. This last is an improvement in the mechanism for which he previously secured a patent. The regulation of the draught on the thread is done by a movable guide ring which maintains an equal distance from the ring rail as it moves up and down, and thus it keeps the thread at the same angle always with the traveller, laying the threads in a most equal and beautiful manner, forming a cope of the first quality, and preventing much breakage of yarn.

Rope-Spinners' Improved Bobbin.

Mr. R. S. Tucker, of Brooklyn, N. Y., has invented a valuable improvement in Rope-spinners' Bobbins, for which he has taken measures to secure a patent. The improvement consists in constructing the bobbin with a moveable head, which can be screwed and unscrewed on the bobbin shank, to allow the coiled twine to be shipped off the shank and the thread unwound from the centre instead of the outside. No duplicate bobbins, in this case, are required. A vast expenditure for bobbins is hereby saved, and in unwinding the twine from the hollow coil, by commencing at the first end of twine laid, the twine is not roughened, as it now is, by the uncoiling process. It is a most valuable improvement, and will prove of great benefit in the manufacture to which it is destined to be applied.

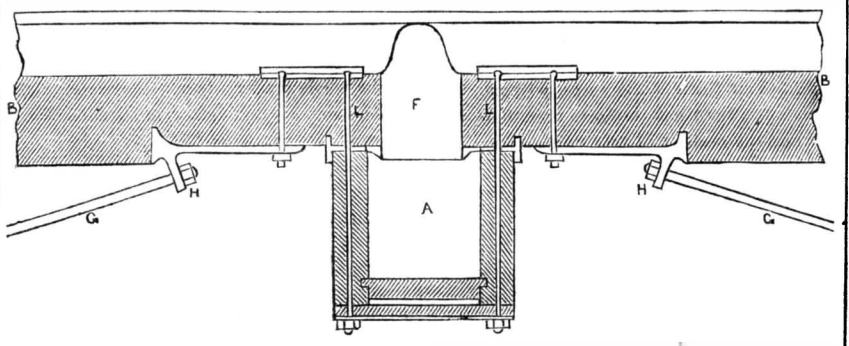
Improved Plow Cultivator.

Mr. L. M. Whitman, of Weedsport, Cayuga Co., N. Y., has made a good improvement on a Cultivator Plow, whereby it can be used either for hilling up the earth upon either side or simply running along and pulverizing the earth without throwing it from the centre. A movable wing or mould board is set upon each side, which can be taken off when not required; one may be used or both as may be found most suitable. Measures have been taken to secure a patent.

A New Patent for Something Old.

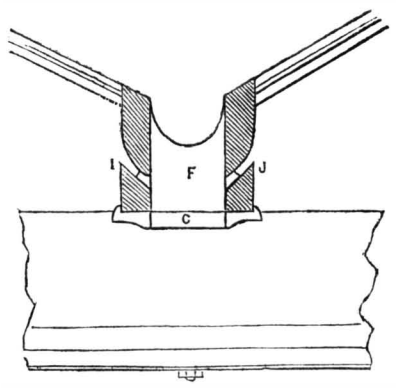
We have received a communication from Mr. Jeremiah Peck, of New Haven, Conn., informing us that the claims for a patent, granted to Charles Atwood & George Kellogg, of Birmingham, Conn., and published in our list for Nov. 13, 1850, was for something not new, but which he believes the patentees were no doubt honest about being the original inventors; but that he made a machine ten years ago embracing the same principle and nearly the same combination of parts. It was put into operation, he says, in Hopkin's & Pritchard's suspender factory, (in New Haven, we suppose), and sometime after 1841, it was sold and carried to Providence, R. I. He says that perhaps he was not the first inventor himself. We do not know, personally, anything about the invention and of course can express no opinion. The best judges of what is practically new, are those who have been and are now engaged in the same business; but people are not always able to judge correctly either about the parts or operation of a machine by the patent claim.

PAXTON'S IMPROVEMENTS IN THE CONSTRUCTION OF ROOFS OF BUILDINGS.---Figure 1.



The accompanying engravings are illustrations of an improvement by Mr. Joseph Paxton, of Chatsworth, England, the architect of the Crystal Palace. A patent was enrolled on the 23rd of last month, and published in the London Patent Journal, from which we select the same, for the purpose of bringing the matter before our people who are much interested in these things, more especially at the present moment. The improvement is on the ridge and furrow roof. Fig. 1 is a longitudinal section, and figs. 2 and 3 exhibit detached parts to which reference is made by letter, the same letters referring to like parts. A is a transverse trough, to represent the method of joining two or more of the gutters, known as the Paxton gutters, together. To the troughs, A, the gutters are affixed by the sole plate, C, and the screw bolts, L L. Notches are cut in the gutters at proper distances apart to receive the

Fig. 2.

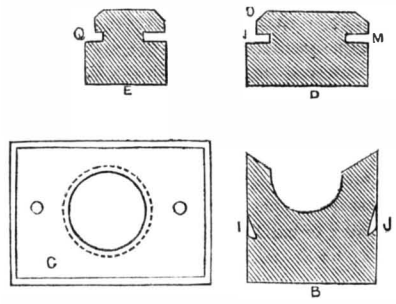


ends of the wide and narrow sash bars, D E, respectively. At the top of these bars is a ridge piece (not shown) running longitudinally with the gutters, and having grooves on each side to receive the edges of the glass. It is also notched to receive the upper end of the sash bars. A round hole, F is cut in the ends of the gutters, and passes through the sole plate C, thus allow the water to run from the gutters into the trough. Cast iron carriages are fixed to the underside of the troughs. G G are rods screwed at both ends by nuts, H H, for the purpose of cambering the gutter. The grooves I and J are cut to receive the water that may be condensed, and run down on the glass inside. This water passes finally through the hole, F, where it enters the trough A.

On the top of the columns or walls, the sole plate, C, is laid, and the gutters then laid on the face of the same, the bolts, L L, screwing all up firmly together. The wide sash bars are then placed in the notches cut for them, and in the ridge piece spoken of, where they are nailed. The groove, M, in the wide sash bar is then thinly coated with putty, and one pane of glass pressed into it. A narrow sash bar previouly prepared with putty is then taken, and the groove marked, Q, pressed on the other edge of the glass, until both ends of the sash bars fall into their notches and are then nailed. The same order is then followed with the other panes of glass up to the next wide sash bar, where the corner would prevent the sash from falling into the groove; this is then partially cut away, as shown by the section at O. When any of the intermediate panes of glass are broken, they are replaced in the same way.

The gutters are made of rectanglar beams of timber, B, the deep top groove being cut out by means of revolving cutters on a shaft. These cutters are intended especially for glass roofs. A severe hail storm visited the Crystal Palace on the 30th of last month, but not a pane of Paxtons glass was broken. We know but very little about glass roofs in our country yet, excepting for green houses. In some of the European cities, there are streets covered with glass roofs, but we suppose that there are more severe hail storms in our country than

Fig. 3.



in Europe; of this, however, we are not certain.

New Railway Signal.

A trial was recently made in England, on the Caledonian Railway, of a new signal enabling passengers and guides in a train to communicate with the engine-driver. The mechanism of the signal and modes of operating are thus described:—Over a series of pulleys, centered in pillars to the engine steam whistle, and extended to the guard's seat at the end of the train, while branch wires communicated with each of the passengers' compartments. The inventor took his position at the guard's seat, and several scientific gentlemen occupied the compartments. The result was most satisfactory—the connections most complete. Every pull of the wire brought forth an answering whistle from the engine. The inventor is Mr. Copling, one of the directors of the Caledonian Railway Company.

Improvement in the Manufacture of Composition Metallic Spoons.

Mr. Luther Boardman, of East Haddam, Middlesex Co., Conn., has made a very valuable improvement in the manufacture of spoons, for which he has taken measures to secure a patent. The improvement relates to the method of wiring, for stiffening the shanks. The wire in this improvement is not taken out of the side nor the end of the spoon shank as is no practiced, but placed and maintained in the interior of the shank, by an ingenous contrivance of the mould, which saves the trouble of filling up the wire passage after the spoon is cast.

A Great Discovery in Engine Power.

We saw some weeks ago, in a Pennsylvania paper, an announcement that a motive power had been discovered which would supersede the use of steam. Some facts have recently come to light which entitle the statement to credit. Prof. Saloman, of Harrodsburgh, Ky., has successfully applied the entire power of carbonic acid gas as a substitute for steam, in propelling machinery for every purpose. The power of this gas has long been known to chemists, but their inability to regulate and govern it, has prevented its use as a propelling agent. Prof. Saloman claims to be able to control it with perfect safety; and that it will afford a power equal to steam in one fiftieth of the space, and one hundredth part of the expense, dispensing with both furnaces and boilers. Experiments have recently been made in Cincinnati which are said to be entirely satisfactory. We are on the eve of a wonderful revolution in science and art. What will be thought of a ship of the line driven around the world by a single ton of coal; the process will not be divulged until patent rights are secured in the different European countries.

[The above is from an exchange. It is well known to those who are acquainted with the history of the steam engine, that Brunnel tried carbonic acid gas in a fluid state, as a substitute for steam, and failed, owing to the inherent nature of the gas, as it respects the difficulty of condensation. The difficulty cannot be overcome we are certain by any means to produce as economical a power as steam.

Genius.

They say of poets, that they must be born such; so must mathematicians, so must great generals, and so must lawyers, and they should excel; but with whatever faculties we are born, and to whatever studies our genius may direct us, studies they still must be. Nature gives a bias to respective pursuits; and this strong propensity is what we mean by genius. Milton did not write his "Paradise Lost," nor Homer his "Iliad," nor Newton his "Principia," without immense labor.

Monument to Christopher Columbus.

A subscription has been started in Spain for the purpose of erecting a monument to the great Columbus. It is indeed time that the nation whom Columbus benefitted by the discovery of a New World, should at this late day erect a monument to his name to wipe out the guilt of incarcerating him in a dungeon.

New Suspender.

A Yankee has just invented a suspender that so contracts on your approach to water, that the moment you come to a puddle it lifts you up and drops you on the opposite side.

[The above is from an exchange. Invention and Yankee appear to be synonomous terms yet the greatest number of patents taken out annually, are by natives of New York. This is no doubt owing to the greater amount of population.

English Patents for American Inventions.

On the 11th of last month a patent for a new paddle-wheel, invented by Mr. Abner Chapman, of Fairfax, Vt., was sealed. On the 14th of the same month a patent was sealed for an invention of a machine for manufacturing railway chairs, invented by Mr. Wm. Van Anden, of Poughkeepsie, N. Y. These inventions have been held to be of great value.

These patents were secured through this office, and those who desire to obtain foreign patents can obtain them through this office—promptly and at reasonable rates.

A child about three years of age is astonishing our citizens by playing on the drum. It would be more wise like if his parents would exhibit him less.

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Actinism.

The discoveries of modern science are justly the theme of eulogy and praise by authors of the present day. The time was, however, when the case was different. Poets like Pope would have doomed a poem to the shades of ignominy, if it had alluded to the Telegraph or Steam Engine. Connected with science, there is everything to elevate and expand the soul. The telescope reveals to us a world in every spark that glitters in the sky, and the microscope, one in every dew drop that glitters on the rose. It is a fact, that notwithstanding the discoveries which man has made, he is still a very ignorant being. This we know from the newest discoveries and by those which are making every day. The Book of books opens with the most thrilling event of God's creation—the first mandate from the Great I Am. And what is it?" "And God said, Let there be light, and the light was." A thousand volumes of science are embraced in that copulative sentence. Before it was uttered, all was dark, without form, and void, but as the glad beams burst forth, beauty began to assume her sway, and harmony to chaunt her sweetest songs. Mankind have been comparatively ignorant of the great mission of light, the important office it performs and the combination of it with the sun rays as a worker in the economy of the Universe. The science of photography is but of yesterday, and who knows how much we have yet to learn. "A sun ray is a magical thing," says Robert Hunt, and so it is. Light, heat, and the beauties of color,—and may we not say, form also—are attributable to the radiations of a great vital principle, ethereal as the breath of the butterfly, but terrible, also, as the earthquake, the lightning, and thunder. It was discovered by Niepce, that no substance could be exposed to the sun's rays without undergoing a chemical change, and he soon produced the images of his friends drawn with a sun beam. The common opinion respecting the production of photographic pictures is, that they are drawn by *light*. This, however, is not so, and this brings us to the explanation of the term which forms the caption of this article.

If we take a glass prism, such as the pendant of a girandole, it enables us to dissect the sun's rays. We can see, in this colorless substance, the most beautiful colors. By this triangular piece of glass we bend the white light out of its straight path, but in this ray of light we also find heat, and it is not bent or refracted so much out of a straight line by the glass as are the other powers which are contained in the ray. At the point, and in the straight line through which the ray should travel had it not been for the triangular piece of glass, the heat action of the ray diminishes regularly on either side. The light of the ray shoots off at a greater angle, and its maximum of power, is above that of the heat, and diminishes upon either side, producing orange, red and crimson colors below the maximum, and green, blue, and violet above it. Along with the light and the heat contained in the ray, there is another power which produces chemical changes. The radiations of the beam of white light, which produce the chemical changes, are more refrangible than those which produce heat and luminosity. The maximum of this power, as dissected by the glass, is at a point where the light rapidly diminishes, and where scarcely any heat at all is detected, and it extends beyond its maximum to a distance where no trace of light is discovered, and it extends inwards until the light appears to nullify its powers and peculiar properties. This last principle—the chemical power of the radiations, is called Actinism, and it is believed that light and *it* are not identical. It is actinism which produces photographic pictures. If we take a blue glass, stained with the oxide of cobalt, it will scarcely admit light, but it offers no barrier to the passage of actinism. On the other hand, yellow glass offers but little interruption to the luminous rays, but it cuts off the chemical principle—the actinism. A blue silk dress, worn by a person of whom a photographic likeness is taken, presents a light ground—so does a blue eye; but a yellow dress—and this contrary to what the majority would suppose, produces a dark ground—it obstructs the actinism or chemical action. A bright sunny sky is not a good one for the daguerreotypist, —the cloudy atmosphere of England has been found superior to that of sunny Mexico.

We need much light, yet, on the subject of light; and in connection with the above, were it not that we do not wish to extend the article to an undue length, we would say something about a photography in connection with light, which is produced by mechanical action; but we will speak of it next week.

The grand object of photographists, in the improvement of their pictures, has been the production of all the colors, at once, instead of the light and shadow merely. Bequerrel, of Paris, has produced the colors, but he never could fasten them. We have heard that one of our American artists has at last extorted from nature this secret. We hope that it is so; if true, it is one of the most important discoveries ever made, and it will confer both wealth and lasting honor on the discoverer.

The Patent Office Building.

When Congress passed the first Act to build the present Patent Office, the erection of the building was ordered not to exceed $108,000, to be paid out of the Patent Fund, but with a prodigality, common to all government jobs in Washington, it would appear, and for which the *Patent Fund* is in no way responsible, the expense for building the main part of the structure, and that with rotten, crumbling stone, cost over $300,000, the surplus being paid out of the public Treasury. But the Patent Fund had no business to pay the whole. Why? Because the building was appropriated to another purpose by the Government, namely the "National Gallery,"—thus doing injury to the spirit and intent of the Patent Institution, as it was designed to arrange and classify all the models for public inspection for the benefit of science; a thing which has never yet been done. The Intelligencer says: "As the claim is made for the exclusive use of the building as the property of inventors, is founded on the fact that their funds paid for its erection, is there not in this view of the subject sufficient ground on the part of the United States to the use of the building proportionate to the means furnished." This is an argument just like the policy pursued towards our inventors by our politicians. Now this is not the way to speak of inventors; they are part and parcel of the people, and not some kind of beings outside of the United States, as would be inferred from the language we have quoted. The Reports of every Commissioner of Patents for six years have complained of a want of adequate room to do the business, and at the present moment there is $500,000 of property, in models, in the building, a great deal of which is spoiling for want of proper room and attention. We think that we have a right to claim some salvage for the patent treasury, upon the principle of equity. Three years ago the examinations of applications, were about one year behind, all for want of a correct appreciation on the part of the Government, of the wants of inventors and their just claims. It has been the custom of Government to be very liberal in appropriating the Patent Fund to other objects than those connected with patent business, or that immediately related to the same. Thus, in 1848, $1,000 was appropriated out of it to a Mr. Smith for agricultural statistics, under Mr. Ellsworth. In 1849, $3,395 76 were paid out of the same fund for agricultural statistics, and $1,400 for an analysis of some bread stuffs. Would it be right to order one cent to be paid out of the Post Office Fund for experiments in steam or gunpowder? No. Well, then, we cannot see but the appropriation would be as fair as those we have mentioned, which were made out of the Patent Fund; but curious explainers of the Patent Laws, have seen and, like the Intelligencer, do see otherwise. We have no personal feelings on the subject; we believe it to be our duty to speak out, as we have done, and if the Intelligencer takes up the back Reports of the Commissioners of Patents, we are confident that it will (or we much mistake its general fairness), give us a good leader about the neglect shown by Congress to the interests of inventors, and we thereby mean the progress of good and useful improvements in science and art.

We would be quite willing and glad to see one wing, or two if they are required, devoted to an Agricultural Department, but we want all agricultural implements and applications for patents relating to the same, under its supervision. The farmer and mechanic go hand in hand in improvements, and they should not be separated in the Patent Office. But we don't want other business and other interests, apart from the *patent relation*, mixed up with the affairs of the Patent Office; and judging from the past, we believe, if the Interior Dept. appropriates any of the building to its uses, the time will come in a very few years, when the models will be piled up on the top of one another in the cellar, the same as they are now.

Cast-Iron Pavements.

We have received a pamphlet by Thomas A. Davies, of this city, describing a new kind of pavement for streets which he has invented and proposes as a substitute for all other pavements. The following is his method of constructing the said pavement:—

"The cobble-stones having been removed and the carriage-way graded, dig trenches across the carriage way eighteen inches deep, from gutter-stone to gutter-stone, and five feet apart. In these trenches, place spruce timbers, six inches by twelve, upon their edge, which over-lap each other one foot on the sides at the centre of the street, and are bolted together with a heavy bolt with washers, nut, and screw. These cross-timbers rest upon the ground, and are so placed as that their tops form the counter part of the intended grade of the street. The earth is then rammed in around them, so that there is formed for them a solid bed. The tops of these timbers at the gutter-stone are seven inches below the outside edge of it, and will have a pitch each way from the centre of the street to the gutter-stones of six inches.

On the crown of the street, and over each of the laps thus bolted together, is laid lengthwise of the street a spruce timber, six by twelve inches, and the top chamfered each way to correspond with the side pitches: the crown of these cross-timbers having been first levelled to receive this timber. Then, nineteen inches from this timber, on each side, are laid other timbers, resting on the cross-timbers flat-wise, six by twelve inches, and so on to the gutter stones—the last timbers being laid in contact with them. The whole is filled in with dirt even with the tops of the last set of timbers, and all thoroughly rammed. On this last set of timbers, and upon the earth between them, are laid cast iron plates, thirty-one by twenty-four inches, with the longest dimension laid across the street and alternately breaking joints, cast in a form hereafter to be described, first having placed under the joinings of the plates on the timbers, and sunk into them even with their tops, a five-inch cast-iron disc. The plates are then screwed down, with ⅞ inch screws with square heads, to the timbers, till all have a good bearing. The crown timbers and those next the gutter-stones are firmly bolted to the under set of timbers.

The use of the cast-iron disc is to prevent the edges of the plates cutting or working into the wood. The joints of the plates are so cast that they bevel out at the top, so that the dirt will wedge in and make the structure water tight. The gutter ways to carry off the water next the curb are the ordinary gutter-stones laid in cement, as usual—the iron joining with them and making a joint in cement."

[We differ in opinion from the author of this system; we believe that cast-iron is but illy adapted for pavements, when subjected to much crushing and grinding action, as it would be in a pavement. He states that "stone laid in a substantial manner was resorted to in London—after wood pavements —at first with great probability of success. But experience has led to see disadvantages which promise to prove fatal to its use in that form. The surface of the stone becomes smooth by wear, and slippery when wet or frosted, to an extent that damage results therefrom, and a mortar forms by the dust which causes the horses not sharp shod to slip easily." If this had been said of the New York large cube pavements, he would be correct. In London the pavements have been made out of small basaltic blocks from time immemorial, and are the best kind in use, or ever will be, in our opinion. The way to make good, durable, conveniently-lifted, anti-horse slipping pavements, is to get blocks of Staten Island granite, cut about five inches wide and eight inches long, and laid upon a stratum of sand mixed with chalk or plaster of paris, well beaten down. Our cobble stone pavements would be far better than they are, if well laid down, but we never saw pavements laid so carelessly. Cast-iron wears very fast—even faster than good granite; corrugated cellar caps, of cast-iron, on the pavement before our office, have worn smooth with foot passengers in one year, how much faster they would wear in the causeway, we may well conjecture. In laying the small blocks of which we speak, everything depends upon the manner they are laid down. In London some pavements have endured without repairing for ten years—and they are made of small blocks, or, as they are termed, "sovereign pavements."

Lightning Rods.

MESSRS. EDITORS—In the Civil Engineers and Architect's Journal for Dec., page 399, Prof. Farraday says, in speaking of electrical conduction:—"No advantage is gained by expanding the lightning rod into a strap or tube, surface does nothing—the solid section is the essential element." Now Mr. Paine claims, according to G. Q. Colton, (Tribune, January 7), and it accords with previously received opinions, that "it is only on the surface of the wire that the electricity can be conducted." Please give us your decision in the case of Paine vs. Farraday. Respectfully,

G. W. C.

Harrisburgh, Pa., 1851.

[The article to which our correspondent refers, is a letter of Mr. Farraday, F. R. S., to George Buchanan, C. E., of Edinburgh, on the protection of buildings by lightning conductors. We will give the substance of that letter, as it is a matter of very great importance to us in this country, where we have so much lightning. He says, "the conductor should be of half-inch copper rod, and should rise above the top of the chimney by a quantity equal to the width of the chimney at top. The length of the rod should be well joined metallically, and this is best done by having one length a screw socket and the other a screw to fit into it." As respects electrical conduction, &c., it is the same as in the above letter. The article is published in the last number of the Franklin Journal, and the editor remarks nearly in the same manner as our correspondent. But have correct and good authorities held this opinion? We presume not. It is well known that the current of electricity from a galvanic battery developes heat when resisted, although the point of resistance may expose as much metallic surface as the parts, where no heat is developed. Thus, if a strip of gold leaf forms part of an electric circuit in connection with a copper wire of a greater solid section, but even less surface, heat will be developed in the strip of gold. This shows that Farraday is right, and it also shows, that many *high authorities* have been wrong.—The chemical and mechanical powers of electrity, are developed by arrangements for the resistance, or retarding of the current, and the good conducting effect of metals, by the solid section of the conductor—the solid section, then, is the essential element of a good electric conductor.

The State of Illinois has passed a Homestead Exemption Act.

The population of the United States amounts to 20,067,720 free persons, and 2,077,034 slaves.

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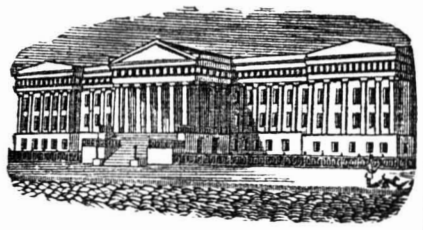

☞ Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.
FOR THE WEEK ENDING FEBRUARY 19, 1851.

To E. H. Ashcroft, of Boston, Mass., for insulated fusible plug for Steam Boilers.

I claim the arrangement, herein described, for surrounding a fusible plug and its case, by a stratum of air, in such manner that the plug shall promptly melt and give warning, after the water gets low in the boiler, but before the boiler plate to which the apparatus is applied, is left bare of water, substantially as set forth.

I also claim the arrangement of the stopper and plug case, substantially as herein described for stopping the escape of steam, to admit of the replacement of the fusible plug, without blowing off the steam or water from the boiler, after the plug has melted, substantially as herein set forth.

I likewise claim the method of preventing the waste of the metal of the plug after it has melted, by supporting it in a closed socket, the lower unoccupied part of which is of sufficient capacity to receive and retain the metal when melted, and to allow the steam to pass over it to escape.

To Thomas Champion, of Philadelphia, Pa., for improved Annular Steam Boiler.

I claim, first, the employment of the tapered ring for closing the ends of any of the water spaces of the concentric boilers, in the manner set forth.

Second, I also claim connecting the lower parts of the annular water spaces, each to each, from the upper and inner to the lower and outer one, substantially as described, by metallic rings or collars—thus giving free ebulition, assisting evaporation, and allowing the dirt to settle down into the blow-pipe, from whence it may be blown out—the aforesaid rings or collars bracing the boiler, as well as forming the connection between the cylinders.

To H. Garretson, of Clay, Iowa, for improvements in Hand Looms.

I claim the device, consisting, substantially of the tappet shaft, with its ring block, and together with the connecting cord, weight, and marches, whereby the heddles are raised and depressed in the proper order to form the shed, by the movement of the lay, substantially as herein set forth.

I likewise claim the device, consisting substantially of the levers, with the breast beam, cords, and picker-stick-cords, whereby the picker sticks are moved to drive the shuttle by the movement of the lay.

To P. S. Bears, of Hamden, Conn., for improvements in Machines for Turning Irregular Forms.

I claim, first, the three cutter cylinders (with cutters arranged as within described), in combination with the sliding frame, compound cams and cam rails, constructed and arranged substanially in the manner and for the purpose herein described.

Second, I claim the combination of the compound cams and cam rails, with the sliding rails and devices (within described) for holding and revolving the timber material, whereby such vertical motion is produced in the latter, which, being subjected to the action of revolving or vibrating cutters, as to reduce the timber to the required form.

To John A. Fry, of Edinburg, Va., for improvement in Tools for Tongueing, Jointing, and Rebating.

I claim so making a jointing, tongueing, and rebating plane, that the jointing and tongueing of a board, while resting on its edge, and also the jointing and rebating of it while it lies on the flat side, may all be performed with one planing tool, in the manner substantially as herein described, and for the purpose herein set forth.

I also claim making the tongueing hand plane in such a manner as to enable the workman to make therewith, tongues of various thicknesses, substantially in the manner herein set forth, whereby I prevent the necessity of providing different tools to tongue planks of different thicknesses

I also claim, in combination with a divided body or plane stock, the two cutters, having each a cross-cutting and side-cutting edge, and the means, substantially as herein described, for adjusting the distance apart of the two cutters and bodies, whereby the plane is made capable of dressing the sides of a tongue to any desired thickness, and at the same time to cut the shoulders, as herein specified.

I also claim, in combination with the gauge, the use of the *body*, and the cross edge of the cutter, to constitute a jointer, to straighten the edge of a board, preparatory to tongueing it, and while resting on its edge, in a situation to receive the tongueing.

I also claim the gauge, in combination with the notch, and the side edge of the cutter, acting as herein described, as a jointing plane, to straighten the edge of a board or plank, resting on its flat side, in a position to have a rebate cut in the manner substantially as herein set forth.

To C. T. Judkins, of Lowell, Mass., for improvement in Weavers' Heddles. Dated Feb. 18, 1851; ante-dated Dec. 10, 1849.

I do not claim metal, in combination with harness, or heddles, when used in the solid state and fixed to the harness or heddle yarn, at each end. But I claim covering, coating, or lining the loops or eyes in heddles, of a harness, with metal, by the process I have shown, or by any equivalent process.

To Wm. Post, of Flushing, N. Y., for improved attachment for opening and closing doors or shutters.

I claim the use of swinging attachments or jibs, for moving sliding doors, or shutters, constructed and operating substantially in the manner herein shown and described.

[This is an excellent invention.]

To Philip Rhodes, of Pittsburgh, Pa., for improved snatch-block.

I claim the closing up of the opening in the sides of a ship's snatch-block by means of a gate arranged and operating substantially as herein set forth, by which I am enabled to make the block shorter and more compact than it has heretofore been made.

I also claim the securing the pulley axle in its place, without the aid of screw and nut, or rivet heads, and in such a manner that it can be readily removed by means of the combination of the said pulley axle, with the enclosing strap, and the gate strap, substantially in the manner herein set forth.

To L. H. Southworth, of New York, N. Y., for improvement in Planing Machines.

I claim, first, the use of circularly grooved rollers in front of the cutter, to divide and cut the unplaned surface of the board, into narrow, longitudinal strips, whereby the outer shavings are taken off in narrow strings, or threads, in the manner and for the purpose herein set forth.

Second, I do not claim, simply, the arrangement of the plane stocks, with their cutters, upon the travelling frame, in such order, that one gang or set of cutters will plane one plank, by their movement in one direction, and another gang of cutters plane another plank by their movement in the opposite direction, and remove the first plank planed from the bed; but this I claim, only when these are used in combination with the circular groove circular roller, as within described.

To Isaac Straub, of Cincinnati, Ohio, for improvement in Saw Mills.

I claim the method of imparting a rocking or curved motion to the saw, and of straining the same, by mechanical devices, substantially such as herein described.

To J. T. Willoughby, of Scotland, Pa., for improvement in apparatus for raising and carrying water.

I claim the double draught cord, so arranged and connected with the car windlass, that it effects the two-fold purpose of propelling the carriage to and fro, and of turning the car windlass, to unwind and wind up the bucket cord, thus ensuring the descent of the bucket into the well.

To E. J. Delany, (assignor to H. J. Adamson), of Philadelphia, Pa., for Design for Umbrella Stands.

Horseflesh for Food in Prussia and Austria.

In Austria the Government some time since gave, or rather renewed, a former permission for the sale of horseflesh as food. In Berlin the sale is also legal; but in spite of the efforts of unprejudiced philosophers, who can fall back on beef, and only patronise the equine substitute on principle and by way of example, the article does not find its way, avowedly at least, into consumption. Nothing seems to overcome the obstinacy of the public in this particular, and the philosophers eat and write in vain. They say, "It is reserved for the 19th century to root out a prejudice sanctioned by civilization, and to restore horseflesh to its true place as an article of consumption." But the 19th centuryis in this matter one crust of prejudices. The Berlin dinners at which all is horse-flesh under different modes of preparation, are still confined to a very limited circle, and it is believed are decreasing in frequency; but the question seems to be agitated again in Austria. There, too, the public are averse to "strange flesh," and display a perverse preference for beef and mutton. The example of the Tartars and the ancient Germans is repeatedly cited, but in vain. The skeptics reply that both those respectable races ate their horses for the same reasons that the French cavalry in retreat from Moscow cooked their steeds, because they had nothing better, and that misery makes men acquainted with strange food as well as strange bedfellows. The error of the horse eaters is, that they recommend for consumption the old and worn out animals who are relieved by age from the shafts or the plow; they regard every horse that escapes being eaten as so much nutrition lost to society; if they could bring into the market young and tender animals, with sinews unhardened by years of toil and driving, they might make more progress; but a young horse is as expensive to bring up to an eatable state as a bullock; so that there is nothing gained.

Propellers.

The British are constructing steam propellers at no small rate, and we would do well to pay some attention to the same. We were glad to see Commodore Skinner, in his last report, recommend the building of a number of naval propellers, and it gave us equal pleasure to see the same policy recommended by the Naval Bureau of Construction. All the new coasting vessels now being built in England, are propellers; and so many improvements have been made, that they are now almost equal to the paddle steamers. The city of Philadelphia appears to be the great American port for building propellers, and fine vessels they do make. Philadelphia will yet be a great place for building steamships—the reason for expressing this opinion is her situation for coal and iron.

We see by one of our Liverpool papers, that a great feat was performed not long ago by a propeller built on the Clyde. The Admiral, a paddle steamer of 700 tons and 300 horse power engines, left Greenock for Liverpool, and was followed shortly afterwards by the Arno, a screw propeller of 750 tons and 150 horse-power, designed and built by Messrs. Wood and Reid, at Port Glasgow, and intended for the Mediterranean trade. The Admiral had a start of from two to three miles, and during the passage down the Clyde gained a little on her adversary, owing to a strong head-wind which prevailed. On getting into more open water, under a little alteration of the course of each vessel, the more ample spread of canvas by the screw boat told greatly on her speed and she gained considerably on the Admiral, and both went into Liverpool together. The Arno's engines attained a speed of 60 revolutions per minute. She carried 600 tons of coal, and the average speed was 14 miles per hour. This was good sailing.

The Original Inventor of Flax Cotton.

A correspondent writing to the Philadelphia Ledger, claims the invention of "Flax Cotton" for Sands Olcott, of New Hope, Bucks Co., Pa. He says "it was brought to perfection and patented by him in 1839. It consists in taking the sun or kiln dried flax in the stem, spreading it out upon a wide feeding cloth, from whence it passes through a series of long fluted wooden rollers, say thirty sets, that is, sixty altogether, viz: thirty upper and thirty lower rollers, which so crush and break the stalk, that most of the wood drops from the fibre and renders the process of cleaning it easy.

The flax when separated from the wool is twisted into a rope; the rope should be rove about the thickness of a stout man's arm. This rope is then passed through another series of fluted rollers about six inches wide, and made either of wood or metal, the ends are twisted together, and an endless rope thus made; the rollers (a series of 20 or 30 sets) are then put in motion and a stream of water set flowing over them. The rope passing through in an endless round, the remaining particles of wood, or shives as they are techanically called, are rapidly separated from the fibre, the gluten and coloring matter washed out, and the fibre itself reduced and divided into smaller and finer tribes. After the process has been continued a few hours, the rope is withdrawn much diminished in size, and quite white. On entwisting it when dried the product is "flax cotton."

This article is much more beautiful than the finest cotton, it is almost as soft as silk, and exceedingly glossy, but when closely examined it presents many imperfections. The fibres vary from half an inch to three inches in length, while the polished glossy surface of each fibre prevents their adhesion. The first difficulty Mr. Olcott obviated, by a machine he invented, that tore or separated the rove into equal parts, but the last difficulty, he never successfully overcame.

Mr. Olcott, after several unsuccessful efforts to introduce his invention in this part of the country, went to Cincianati, and applied it to the breaking and preparing of hemp, for the making and bagging and rope at the factory at Newport. He died there of consumption, in 1841 or '42."

[The above process will, no doubt, do all that is claimed for it. Mr. Olcott obtained two patents for his invention—not in 1839, as mentioned above, but in March and April 1840.—Ed.]

Sharp Frosts in Valleys.

Lawrence Young, Chairman in the State Fruit Committee for Kentucky, to the Pomological Congress, states the following fact in illustration of the advantages of planting tender fruit trees on elevated ground instead of in valleys:—Lieut. Mauray placed a thermometer on a high portion of his orchard grounds, and another at the bottom, thirty-five feet lower. At 1 A. M. he found the thermometer at the bottom at 28°, and being surprised to see that on the hill at 33°, changed their position, but was soon convinced that there was a difference in temperature between the two points of five degrees.

Preserving Fresh Beef, &c.

Mr. Robin has communicated a paper to the Academy of Sciences, Paris, detailing a number of experiments made by him in the preservation of animal substances. He states that coal oil, chloroform, ether, and some other oils, preserve animal substances. By placing fresh beef in a well stoppered bottle, with a sponge containing coal oil, sulphuric ether, or chloroform, at the bottom, he was able to preserve the meat fresh for eight months. The vapor of chloroform and of rectified coal oil, preserved the meat in color and form perfectly fresh. This is something of great importance. He recommends the use of pure coal oil, in the preparations of leather, such as for curring; also for the preservation of anatomical specimens and the embalming of bodies.

Nutmegs have been found growing wild in Australia. This will no doubt injure the business of Ceylon in that ktnd of *ware*.

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TO CORRESPONDENTS.

"H. H. B., of N. Y."—Window blinds constructed of tin, and operated substantially (not precisely) as you describe, have been in use, and are not patentable.

"J. C. D., of O."—The Straw Cutter which you have described is not new; therefore not patentable. We have a model of a straw cutter now in our office which has the knife arranged almost precisely as the one shown in your friend's drawing.

"B. Fitts, of N. H., and W. D. Barber, of N. J."—It is several months since we forwarded documents for you to sign, and since we have written several letters without receiving replies. Where are you and what is the cause of your long silence?

"H. H., of Conn."—There is a factory at Williamsburgh, near this city, for impregnating timber upon Mr. Payne's process. We do not know how it has succeeded, but presume that the object of impregnating is a good one. The sulphate of copper is the substance used.

"A. S., of Ala."—We have just received yours, and will give it attention.

"J. W. A., of Mich."—Mr. Reynolds plan was invented by him a long time ago, and he at least could not know anything about yours, neither could we. We can only speak of that which we have first seen, and the large valves are very important. The section tubes are old and well known, and not claimed by Mr. R.

"L. S. G., of Ky."—We understand you to mean the injection of steam into the furnace, there decomposed, so as to act both as a blast and for the hydrogen. This has been tried before, but it is not so good as the fan blast, and never answered a good purpose.

"H. P. H., of New York."—We have not tried the dipilatory powder you refer to, and could not speak from personal experience. We would not advise its constant use however, because we believe that the lime cannot be constantly used with impunity.

"A. J. M., of Ind."—The pipe to which you refer was iron. It is not possible to give you any rule for what you require, because 100 gallons could be passed through a 2 inch pipe in 20 minutes, and 200 gallons in 10 minutes. It all depends on the head or power applied to force the water.

"E. B., of Conn."—Yours will be attended to. The mistake was actually in the list of patents sent us from the patent office. It struck us forcibly at the time, but we forgot to make a note commenting on the same. We will set that matter all right.

"N. E. G., of Miss."—We cannot give you the information you desire, but if we in any way should get it, we will not forget you.

"M. C. H., of———"—We have given you the receipts. We do not believe the work you speak of, is one of merit.

"R. S. J., of S. C."—There is a work published by Carey & Hart, of Philadelphia called "Morfit's Applied Chemistry," which gives a full description of the methods of making soap, candles, and lard oil.

Money received on account of Patent Office business, since Feb. 19, 1851:—

J. H., of N. Y., $30; A. W. D., of N. Y., $50; D. C. McC., of N. Y., $45; J. H S., of Mass., $35; C. J. F., of Ill., $40; L. A. S., of N. Y., $43; J. C. S., of N. Y., $30; G. M. S., of Ga., $25; J. J., of N. Y., $20; G. J. W., of Me., $30; G. B. R., of Conn., $35; S. L. S., of Ga., $55; and B. & H., of N. Y., $35.

Specifications and drawings belonging to parties with the following initials, have been forwarded to the Patent Office within the past two weeks:—

A. D. S., of N. Y.; J. T. D., of N. Y.; J. V T., of N. Y.; T. R., of N. Y.; W. L., of N. Y.; L. B., of Conn.; J. H. S., of Mass.; D. C. McC., of N. Y.; J. C. T., of Conn.; L. A. S. for T. R. B., of N. Y.; C. A., of Pa.; R. A. V., of N. Y.; J. A. & Bros., N. Y.

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office; stating the name of the patentee, and enclosing one dollar as fee for copying.

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American and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Branches of our Agency have been established in London, under the charge of Messrs. Barlow, Payne & Parken, celebrated Attornies, and Editors of the "Patent Journal;" also in Paris, France, under the charge of M Gardissal, Editor of the "Brevet d'Invention." We flatter ourselves that the facilities we possess for securing patents in all countries where the right is recognized, are not equalled by any other American house. MUNN & CO.,
128 Fulton street, New York.

VALUABLE PATENT FOR SALE—Embracing Massachusetts (with the exception of two small counties, and a few towns of minor consequence), Connecticut, and Rhode Island, entire. The assignment of Morse's Patent Tan, Sawdust, Peat, and other fine fuel Burner for heat, the cost of such fuel being nothing, together with a complete assortment of patterns, is now offered for sale for a term of about ten years, (patented 1846), on advantageous terms, with a stock of stoves ready for use, with the same if desired. The stoves yield a good profit, many hundred have been and many thousands must be sold.

The assignment belonging to a firm dissolved, must be sold to close the concern. To those persons who are using this patent unlawfully, I say you are known and watched, and will soon be called upon to render an account for such violation. For further particulars inquire of E. F. DIXIE, Worcester, Mass. 24 3*

MACHINES FOR CUTTING SHINGLES AND STAVES.—The undersigned is the owner of the following States of Wood's Improved Shingle Machine, Patented Jan. 8th, 1850, viz., Maine, New Hampshire, Vermont, Delaware, Maryland, Virginia, North and South Carolina, Georgia, Alabama, Florida, Arkansas, New Mexico, California, Oregon, District of Columbia, and one half of Connecticut. The above territory is for sale with or without the machines. No machine ever patented can do the same amount of work in so perfect a manner. Address CHARLES WATERMAN, West Meriden, Ct. 24 tf.

BROWN'S PATENT COUPLING FOR HOSE AND PIPES.—This valuable invention (which was illustrated and described in No. 42, Vol. 5, Sci. Am.) is now offered for sale on reasonable terms in either town, county, or State rights. For further information address, post-paid, the inventor and patentee, A. H. BROWN, Commercial Buildings, Albany, N. Y. 24 2*

NOTICE TO MACHINISTS.—Wanted, immediately, a competent hand as foreman of a machine shop, where the principal work done is building stationary steam engines. An industrious man with steady habits, who can give testimonials of his ability to do, and direct work in such a shop, will be sure of employment at generous prices, if application be made soon. Reference—Wm. Kemble, 79 West st., N. Y. Address E. W. HUDNUTT & CO., Geneseo, Livingston Co. N. Y. ☞ Wanted, 2 or 3 good machinists. 24 4*

GROSHON'S PATENT CORN PLANTER. The inventor and patentee of this excellent invention, which was described in No. 40, Vol. 5, Scientific American, desires to dispose of State, County, or Town rights on reasonable terms. Address J. P. GROSHON, Yonkers, N. Y., post-paid. The invention has been awarded premiums from the American Institute and State Fair. 24 2*

ELECTROTYPE PATENT FOR SALE.—The subscriber offers for sale the right of his process for preventing adhesion in the Electrotype operation. Engraved plates of the finest kind, amounting in value to nearly $100,000, have now been duplicated by this process, without the slightest injury having occurred in any instance. It is believed that a respectable business in multiplying engraved plates could be established in any of the large cities, especially if carried on in conjunction with electro-plating and gilding. Only three rights will be sold, which will be for Boston, New York, and Philadelphia, or an exclusive right for one city, and these rights will exclude all others, excepting one to be reserved for some place south of Pennsylvania, and the right now owned by the United States Government. GEORGE MATHIOT, Washington, D C. 23 3*

A YOUNG MAN, a Mining Engineer, who has been surveyor and manager of silver mines and smelting houses, in Mexico, wants a similar situation in this country. He is well instructed in all the branches of mining science—speaks English, French, German, and Spanish, and possesses very good testimonials Address F. S., 218 William st. 23 2*

TO WOOLEN MANUFACTURERS.—For sale, a Wool Carding, Dyeing, and Cloth Dressing Establishment, situated in the town of Somers, Westchester Co., N. Y. The building is in good repair, and the machinery in perfect running order. The location of the establishment affords the best facilities for country manufacturing. Further information may be obtained by addressing the subscriber at Peekskill, N. Y., or personal application made to him on the premises. R. C. VERNOL. 23 2*

IRON FOUNDERS MATERIALS—viz., fine ground and Bolted Sea Coal, Charcoal, Lehigh, Soapstone and Black Lead Facings of approved quality. Iron and brass founders' superior Moulding Sand, Fire Clay, Fire Sand, and Kaolin; also best Fire Bricks, plain and arch shaped, for cupolas &c.; all packed in hogsheads, barrels or boxes for exportation, by G. O. ROBERTSON, 4 Liberty Place, near the Post Office, N. Y. 22 3m*

WORLD'S FAIR ART UNION—Incorporated by the New York Legislature; shares $5 each. Fifty Prizes. A Prize is a first cabin passage to London and back, and $100 to pay expenses while in London. In addition every subscriber has a magnificent engraving of the interior of the Great World's Fair—really worth $5. The subscription list is filling rapidly, and as the number of shares is limited by the charter of incorporation, application for shares should be made forthwith. A remittance of $45 will entitle the sender to ten shares Remittances by mail will be at the company's risk. Drafts to be made payable to the order of the secretary. Funds current at the place whence sent taken at par. All letters must be pre-paid. Shares, or further particulars may be obtained on application, personally, or by paid letter, at the office of the World's Fair Art Union, 50 Wall st., N. Y. By order, J. TOWNSEND, Sec'y. 223*

THE NASHVILLE MANUFACTURING Company (chartered by the State of Tennessee) being now engaged in the erection of extensive machine works, wish to engage the services of a person thoroughly competent to manage the same. It is the intention of the Company to engage extensively in building locomotives, steam engines, &c. None but such as can furnish undoubted testimonials for skill, energy, and other requisites to fill the station, need apply. The Company also wish to employ a number of machinists, founders, &c., and would also receive propositions for the necessary tools, &c., for such an establishment. Immediate application, by letter or personally, to the undersigned, will meet attention.
S. D MORGAN, Prest. Nashville Man. Co.
Nashville, Tenn., Jan 17, 1851. 21 6*

TO LUMBER DEALERS.—Law's Planer having undergone important alterations, is now perfected and in successful daily operation, facing and matching at the same time, and in both respects, in a style not to be surpassed. The common objection that machines are expensive in repairs, is not applicable to these new machines—they are simple, strong, and easily kept in order. It is confidently believed that when they are well known they will have a decided preference over any other machine or mode of planing. Planing of all kinds done at short notice, corner of Water and Jay sts., Brooklyn. Law's Stave Machine dresses and joints staves of all kinds, shapes, and widths, by once passing through. Rights or machines for sale by H. LAW, 216 Pearl street, or after 1st March, at 23 Park Row. 21 8

HUTCHINSON'S PATENT STAVE MACHINE.—C. B. HUTCHINSON & CO., Waterloo, N. Y., offer for sale town, county and State rights, or single machines, with right to use the same. This machine was illustrated in No. 2, Vol. 5, Sci. Am.; it will cut from 1,500 to 2,000 perfect staves per hour. We manufacture machines of different sizes, for keg, firkin, barrel and hogshead staves; also, heading shingle, and listing and jointing machines. These machines may be seen in operation at St. Louis, Mo.; Chicago, Ill.; Savannah, Ga.; Madison, Ia.; Ithaca, N. Y.; Waterloo, N. Y.; Bytown, C. W. Letters directed to us, post-paid, will receive prompt attention. 15 3m*

LEONARD'S MACHINERY DEPOT, 116 Pearl st., N. Y.—The subscriber has removed from 66 Beaver st. to the large store, 116 Pearl st., and is now prepared to offer a great variety of Machinists' Tools, viz., engines and hand lathes, iron planing and vertical drilling machines, cutting engines, slotting machines, universal chucks, &c. Carpenters' Tools—mortising and tennoning machines, wood planing machines, &c. Cotton Gins, hand and power, Carver Washburn & Co.'s Patent. Steam Engines and Boilers, from 5 to 100 horse power. Mill Gearing, wrought iron shafting and castings made to order. Particular attention paid to the packing, shipping, and insurance, when requested, of all machinery ordered through me. P. A. LEONARD.
15 3m

SCRANTON & PARSHLEY, Tool Builders, New Haven, Conn., will have finished 2 Power Planers ready to ship by the 1st of Feb., that will plane 9 feet long, 31 inches wide, and 24 inches high, with angle feed; counter shaft, pullies, and hangers, splining and centre heads, with index plate, and weigh over 5,000 lbs.; also 2 power planers that will plane 5 feet long, 22 in. wide, and 20 in. high, with counter shaft, pullies, and hangers, and weigh 2,400 lbs.—These planers are 25 per cent. lower than any others built. Cuts can be had by addressing as above, post paid. 19tf

LINEN AND HEMP MACHINERY.—I am prepared to contract with companies or individuals for the building of machinery by which linen can be produced as cheap as cotton, from either unrotted hemp or flax; also for making rope or bagging of unrotted hemp—the same machinery which I am now successfully using in the manufacture of kyanized cordage. O. S. LEAVITT.
Maysville, Ky., Jan. 23, 1851. 21 4*

PATENT DREDGE BOAT.—The subscriber having obtained a patent for improvements on the Dredge Boat, offers to sell rights to build and to use his Patent Dredge Boat in any part of the United States; the excavating apparatus consists of twenty scoops, preceded by plows receiving great pressure, and are capable of raising eight or ten cubic yards of mud or gravel per minute; the scooping apparatus may be fitted on an old steamboat or other vessel, for the purpose of removing bars or other obstructions to navigation. A working model may be seen by calling on the subscriber. JAMES CALLAGHAN,
20 10* No. 64 Spruce st., New Bedford, Mass.

TO TIN PLATE AND SHEET IRON WORKERS.—ROYS & WILCOX, Mattabesett Works, East Berlin Station, on the Middletown Rail Road, manufacture all kinds of Tools and Machines of the best quality, both in material and workmanship. This establishment being the only one where both tools and machines are manufactured, superior inducements are offered to the trade; all work warranted, with fair use. Agents in most of the principal cities of the United States and Canada. Orders promptly attended to. F. ROYS,
E. WILCOX.
Berlin, Conn., Nov. 1, 1850. 7 1amly

BROOM MACHINERY.—The most improved and durable machinery for the manufacture of Brooms, for sale by JACOB GRAY, Scotia, Schenectady Co., N. Y. Address post-paid. 22 6*

MATAPAN MACHINE WORKS—Corner of Second and A sts., South Boston. The undersigned have recently enlarged their business and are now prepared to offer a great variety of Machinists' Tools, viz., Engine and Hand Lathes, iron Planing and Vertical Drilling Machines, Cutting Engines, Slotting Machines, and Universal Chucks; also Mill Gearing and Wrought Iron Shafting made to order.
22 12* GEO. HEPWORTH & SON.

WILLIAM W. HUBBELL—Attorney and Counsellor at Law, and Solicitor in Equity, Philadelphia, Penn.

DICK'S GREAT POWER PRESS.—The public are hereby informed that the Matteawan Company, having entered into an arrangement with the Patentee for the manufacture of the so-called Dick's Anti-Friction Press, are now prepared to execute orders for the following, to which this power is applicable, viz.—Boiler Punches, Boiler Plate Shears, Saw Gummers, Rail Straighteners, Copying and Sealing Presses, Book and Paper Presses, Embossing Presses, Presses for Baling Cotton and Woollen Goods—Cotton, Hay, Tobacco, and Cider Presses; Flaxseed, Lard, and Sperm Oil Presses; Stump Extractors, &c. &c. The convenience and celerity with which this machine can be operated, is such that on an average, not more than one-fourth the time will be required to do the same work with the same force required by any other machine.
WILLIAM B. LEONARD, Agent,
13tf No. 66 Beaver st., New York City.

MACHINES FOR CUTTING SHINGLES. The extraordinary success of Wood's Patent Shingle Machine, under every circumstance where it has been tried, fully establishes its superiority over any other machine for the purpose ever yet offered to the public. It received the first premium at the last Fair of the American Institute—where its operation was witnessed by hundreds. A few State rights remain unsold. Patented January 8th, 1850,—13 years more to run. Terms made easy to the purchaser. Address, (post-paid) JAMES D. JOHNSON, Redding Ridge, Conn., or Wm. WOOD, Westport, Conn.. All letters will be promptly attended to. 10tf

GURLEY'S IMPROVED SAW GUMMERS —for gumming out and sharpening the teeth of saws can be had on application to G. A. KIRTLAND, 205 South st., N. Y. 10tf

A CARD.—The undersigned begs leave to draw the attention of architects, engineers, machinists, opticians, watchmakers, jewellers, and manufacturers of all kinds of instruments, to his new and extensive assortment of fine English (Stubs) and Swiss Files and Tools, also his imported and own manufactured Mathematical Drawing Instruments of Swiss and English style, which he offers at very reasonable prices. Orders for any kind of instruments will be promptly executed by F. A. SIBENMANN, Importer of Watchmakers' and Jewellers' Files and Tools, and manufacturer of Mathematical Instruments, 154 Fulton street. 1 6m*

TO PAINTERS AND OTHERS.—American Anatomic Drier, Electro Chemical graining colors, Electro Negative gold size, and Chemical Oil Stove Polish. The Drier, improves in quality, by age—is adapted to all kinds of paints, and also to Printers' inks and colors. The above articles are compounded upon known chemical laws, and are submitted to the public without further comment. Manufactured and sold wholesale and retail at 114 John st., New York, and Flushing, L. I., N. Y., by
QUARTERMAN & SON,
22tf Painters and Chemists

MACHINERY.—S. C. HILLS, No. 12 Platt Street, N. Y., dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills Kase's, Von Schmidt's, and other Pumps, Johnson's Shingle machines, Woodworth's, Daniel's and Law's Planing machines, Dick's Presses, Punches, and Shears; Mortising and Tennoning Machines, Belting, machinery oil; Beal's patent Cob and Corn Mills; Burr Mill, and Grindstones, Lead and Iron Pipe, &c. Letters to be noticed must be post paid. 10tf

BAILEY'S SELF-CENTERING LATHE, for turning Broom and other handles, swelled work, chair spindles, &c.; warranted to turn out twice the work of any other lathe known—doing in a first rate manner 2000 broom handles and 4000 chair spindles per day, and other work in proportion. Orders, post-paid, may be forwarded to L. A. SPALDING, Lockport, N. Y. 21tf

FOREIGN PATENTS.—PATENTS procured in GREAT BRITAIN and her colonies, also France Belgium, Holland, &c., &c., with certainty and dispatch through special and responsible agents appointed, by, and connected only with this establishment.—Pamphlets containing a synopsis of Foreign Patent laws, and information can be had gratis on application
JOSEPH P. PIRSSON, Civil Engineer,
24tf Office 5 Wall street, New York.

RAILROAD CAR MANUFACTORY.—TRACY & FALES, Grove Works, Hartford, Conn. Passage, Freight and all other descriptions of Railroad Cars, as well as Locomotive Tenders, made to order promptly. The above is the largest Car Factory in the Union. In quality of material and in workmanship, beauty and good taste, as well as strength and durability, we are determined our work shall be unsurpassed. JOHN R. TRACY,
16tf. THOMAS J. FALES.

FOWLERS & WELLS, Phrenologists and Publishers, Clinton Hall, 131 Nassau st., New York—Office of the Water Cure and Phrenological Journals. Professional examinations day and evening. 3 6m

MANUFACTURERS' FINDINGS and Leather Binding.—The subscriber is prepared to offer a large assortment of manufacturers' Findings for Cotton and Woollen Factories, viz., bobbins, reeds, harness, shuttles, temples, rockers, harness twines varnish, roller cloth, card clothing, card stripper and clamps, calf and sheep roller, leather, lace, and picker string, potato & wheat starch, oils, &c. Leather Banding, of all widths, made in a superior manner from best oak tanned leather, rivetted and cemented.
15 3m P. A. LEONARD, 116 Pearl st.

UNITED PATENT OFFICE IN PARIS AND LONDON.—GARDISSAL & CO., 9 Arthur st., west, city, London; Paris, 29 Boulevard St. Martin.—Procuration of Patents for England, Ireland, Scotland, France, and all countries; and transactions of all business relating to patents, (sale and licenses,) specifications, oppositions, &c. "The Invention," monthly journal, $1 a-year. 15 4m*

LAP-WELDED WROUGHT IRON TUBES for Tubular Boilers, from 1 1-4 to 7 inches in diameter. The only Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine, and other Steam Engine Boilers.
THOS. PROSSER & SON, Patentees,
16tf 28 Platt st., New York.

STRAW CUTTER FOR SALE.—We have on hand one of Macomber's Improved Straw Cutters, patented Nov. 5, 1850, illustrated in No. 50, Vol. 5, Sci. Am. Price $10 Address MUNN & CO

THE SUBSCRIBER is now finishing four 14 horse engines, with boiler and apparatus all complete—price $1200 each. Several 6 horse engines extremely low; also, several of smaller capacity, complete; also, several power planers, now finishing.—Galvanized chain for water elevators, and all fixtures—price low—wholesale and retail. Orders, post-paid, will receive prompt attention. AARON KILBORN.
No. 4 Howard st., New Haven, Conn. 18 10*

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Scientific Museum.

To Obtain the Metallic Lead from Sulphate of Lead.

There are several processes in the arts in which sulphate of lead is produced as a residuum: amongst other processes may be mentioned that of the manufacture of acetate of alumina, for calico printers. For this purpose a solution of sulphate of alumina is mixed with a solution of acetate of lead, and the resulting decomposition gives acetate of alumina, in a fluid state, and sulphate of lead, precipitated in the form of an insoluble sulphate. M. Schnedermann's process for reducing the sulphate, and obtaining the metallic lead which it contains, is as follows. He makes an intimate mixture of sulphate of lead, chalk, charcoal, and fluate of lime (felspar), and submits the mixture to a white heat. Sulphate of lime, and carbonate of lime, is first formed, which is subsequently reduced by the charcoal. As the sulphate of lime is infusible at the temperature employed, the lead does not unite together in a button, but remains in a divided state, scattered through the mass, unless the precaution of adding fluorspar has been taken. This last named substance possesses the property of rendering the sulphate of lime fusible, thus allowing the particles of metallic lead to unite in one mass at the bottom of the crucible. The proportions employed are the following:—Sulphate of lead, dried in the air, 8 parts; chalk, 5⅓ parts; charcoal, 1 to 1¼ parts; fluate of lime, 3 parts. After keeping the whole at a white heat for one hour, in a Hessian crucible, M. Schedermann obtained a button of metallic lead perfectly free from sulphur. The porous scoriæ contain a few particles of the metal; these may be separated from the scoriæ by washing and decantation, and thus the whole of the lead contained in the sulphate may be recovered.

Use of Chloroform.

Mr. Skey one of the surgeons of St. Bartholomew's Hospital, London, makes the following statements in a work recently published about the use of chloroform in surgical operations:—

"The records of St. Bartholomew's Hospital point to its successful administration in upwards of 9,000 cases, in not one of which, including the aged and the young, the healthy, the infirm, and the asthmatic, has it its employment left a stain upon its character, as an innocuous agent of good. Under all circumstances, its careful employment may be unhesitatingly resorted to in all cases, excepting only such as are marked by determination to the brain of an apoplectic type; secondly, under circumstances of great and serious exhaustion from loss of blood; and thirdly, in diseases of the heart. In these conditions of the system, it is perhaps better avoided.

Against the occasional objections or convictions of others to its employment, I place the strong, and, to my own mind, the unanswerable fact, that it has been successfully used in so large a number of cases in St. Bartholomew's Hospital since its introduction; that these cases have been indiscriminately taken; and that its objections have not yet made their appearance before the observant eyes of the medical staff of that institution, either by promoting danger during the operation, or protracting the recovery of the patient after it.

With the exceptions above mentioned, I cannot hesitate in strongly recommending its administration in all cases of large surgical operations, believing its discovery to be the greatest blessing conferred on the profession of surgery during the last century; and although I have seen its employment pushed, on many occasions, to the apparent verge of apoplexy, I cannot say, even in such examples, that the good has not largely predominated."

Gypsum in Agriculture.

M. Mene has communicated to the Paris Academy of Sciences the result of a number of experiments with the plaster of Paris, which has heretofore been considered a fertilizer. He sowed some seed of wheat in pure gypsum, and watered it every day with pure water. After a few days it germinated like other seed sown in ordinary soil, but the plants were sickly, and after flowering, completely faded away. In a mixture of gypsum (plaster of Paris) and marl, the seed did better, but not so well as in ordinary soil. Seed sown on manure, covered with gypsum, germinated rapidly, and the plants obtained a most extraordinary vigor.

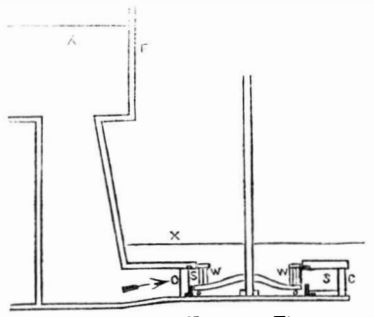
By experiment he discovered that the gypsum decomposed the ammoniacal salts, and by such a combination it acquired fertilizing properties, but pure gypsum of itself had no fertilizing quality.

For the Scientific American.

Hydraulics.

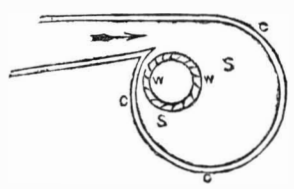
(Continued from page 184.)

Fig. 29.



Parker's Water Wheel.—The accompanying engravings are those of a water-wheel erected at Mr. Attwood's Foundry, Troy, N, Y. Figure 1 is a vertical section, and figure 2 is a plan view. The same letters refer to like parts; X′ is the surface of upper level; X is the surface of lower level; F is the fountain head, the arrows indicate the water course; C is the flume case; S S the spiral flume, and W W the wheel, which is a centre discharge re-action wheel; this wheel was put up in 1847, and we were invited to witness some experiments with it, but were prevented. Afterwards, however, Mr. Parker gave us a description of the same, and also published an account of four experiments. The wheel was 34 inches in diameter, with 8 inches width of bucket rim. It had 16 issues, amounting to 230 square inches; the water went in from the involute sluice at the outside. The motion of the water in the involute coincided with the motion of the wheel. The fall of water was 8·62 feet; it used up 1119 cubic feet of water per minute, made 138 revolutions, and gave out 62 per cent. of power. One peculiarity observed was, the nearly uniform quantity of water discharged, irrespective of velocity. When it made only 84 re-

Fig. 30.



volutions it used up 1104 cubic feet of water, only 15 feet less than when it made 54 revolutions more. The theoretic discharge of 230 square inches under a head pressure of 8·61 feet, is 2,249 cubic feet per minute, while the actual discharge was only about one half. The motion of the water in the volute, or that direction given to it before it acts upon the wheel on passing through the buckets, is very important, as an auxiliary to the power, because direction is everything in this case.

Flax---Cotton.

The Paisley and Renfrewshire (Scottish) Reformer, of Jan. 11, speaking of Mr. Slack's invention recently noticed by us, says Mr. Slack has gone on quietly but perseveringly completing his experiments in dyeing, animalizing and improving the materials upon which he operates, and specimens of the proceeds of these have been sent to our office, and to experienced parties all over the country We have now before us, we may mention, the product of a piece of coarse hemp bagging, in the various forms of fine flax, flax cotton thread, and animalized dyed flax, and we are sure that a glance at the articles referred to will be quite sufficient to satisfy any unprejudiced observer, that the invention, when fully developed, is calculated to effect a surprising revolution in the spinning and weaving manufactures of this country. In addition, we have also had handed to us a piece of fine lawn muslin, figured with the flax cotton, and it is no exaggeration to say, that the flowers have all the lustre and glossy appearance of silk. This, we believe, is the first time on which the flax cotton has been used for the purpose of figuring fine muslins, and the result, we understand from practical parties, is most satisfactory and conclusive.

Beneficial Effects of Tea.

Tea is more and more becoming a necessary of life to all classes. Tea was first denounced as a poison and then as an extravagance. Cobbett was furious against it. An Edinburgh reviewer, in 1823, keeps no terms with its use by the poor:—"We venture to assert that when a laborer fancies himself refreshed with a mess of this stuff, sweetened by the coarsest black sugar, and with azure blue milk, it is only the warmth of the water that soothes him for the moment; unless, perhaps, the sweetness may be palatable also." It is dangerous even for good reviewers to "venture to assert." In a few years after comes Liebig with his chemical discoveries, and demonstrates that coffee and tea have become necessaries of life to all nations, by the presence of one and the same substance in both vegetables, which has a peculiar effect upon the animal system; that they were both originally met with amongst the nations whose diet is chiefly vegetable; and, by contributing to the formation of bile, their peculiar functions have become a substitute for animal food to a large class of the population whose consumption of meat is very limited, and to another large class who are unable to take regular exercise. Tea and coffee, then, are more especially essential to the poor of all nations.

Corruption of Words.

Take, for example, the word kerchief.—There is no doubt that this word is derived from the French *couvre chef*, and obviously meant a covering for the head. Erevity converted *couvre chef* into kerchief. This was well enough for colloquial purposes, and no great harm done. By degrees, however, having occasion to enlarge the application of the word for our convenience, we flung etymology to the winds, and coined the word handkerchief—which, broken up in its constituent parts, means literally a head-cover for the hand. The force of absurdity would seem to be incapable of going beyond this; but worse remains behind. Having reconciled our consciences to handkerchief, there was no difficulty in finding kerchiefs in like manner for all possible purposes; and accordingly we have manufactured a pocket handkerchief, which means a head-cover for the hand to go into the pocket, and a neck-handkerchief, or head cover for the hand to be tied round the neck.

Coal of Puget's Sound.

A specimen of coal taken from Puget's Sound, where it is so convenient for our Pacific Marine, has been analyzed by Prof. Walter R. Johnson, who says, "It has a specific gravity of 1·315, and will weigh in the merchantable state from fifty-one to fifty-five pounds per cubic foot, according to size of lumps, and will require on board a steamer about forty-two and a quarter cubic feet of space to stow one gross ton. It is of a brilliant lustre, wholly free from liability to soil. It is composed of volatile matter, 40·36 per cent; fixed carbon, 56·84 per cent; earthy matter, 2 80 per cent; —100 per cent.

After the luminous flame ceases, the coke burns with a bright glow, and leaves a light brick-red or deep salmon-colored ash.

In coking, the coal scarcely increases in bulk, has no tendency to agglutinate, and consequently preserves an open fire, burning freely, and does not cover itself with ashes to such a degree as materially to obstruct the combustion.

Castor Beans.

The St. Louis Intelligencer says: We learn that 5,000 bushels of castor beans were purchased at Shawnetown on Friday last, by a merchant of this city, for the use of an oil factory in Cincinnati, at the rate of $1,30 per bushel in bulk.

Cheap Pie Crust.

A Crust for pumpkin pies may be made in the following manner. Rub a thin coating of lard over the plate in which the pie is to be baked, and then sprinkle dry Indian Meal over it, to the required thickness of the crust. Then put in the prepared pumpkin as usual when the crust is laid over the plate. The meal will form the crust, and it may be said too that it is better than some we have seen which made more pretensions.

Grease for Coarse Boots.

Take a coal made of white pine of the size of a hen's egg, well burnt, pulverize it finely, mix it with enough of clean melted tallow to make it of the consistence of thick paste. Two or three applications will make the leather soft, and will keep the water out.

LITERARY NOTICES.

The Old Red Sand Stone: by Hugh Miller.—We welcome right gladly such works as the above, and Messrs. Gould & Lincoln, of Boston, the publishers, have conferred a favor upon science and our people in re-publishing it. The work treats of phenomena which occurred in the earlier formation of the earth's crust. It is the production of a working man, who, from a laborious occupation has arisen to be one of the most scientific geologists, philosophic authors, and able editors in the world. We wish this book to be in the hands of every workingman.

Principles of Zoology: Revised Edition.—This is another valuable book by the same publishers. The authors of it are Agassiz, the well known philosopher and pupil of the world-renowned Cuvier, and himself also world-renowned, and the other joint author is Mr A A. Gould, our able and well-known countryman. This new edition is much improved from the previous one, and is written up, in respect to the subjects it treats of, to the present day. Hugh Miller's "Old Red Sand Stone," and his other able work, "The Foot Prints of the Creator," cannot be read intelligently by a novice in Geology, he must first read and study the principles of Zoology. This work is written in a clear and interesting style. It is for sale by L. Colby, No. 122 Nassau st., N. Y.

Shakspeare's Dramatic Works; No. 33; Phillips, Sampson & Co., publishers, Boston, Mass.; Dewitt & Davenport, Agents, Tribune Buildings. This number contains "Titus Adronicus," embellished with a portrait of "Lavinia." This beautiful work is rapidly approaching completion.

Sartain's Union Magazine, for March, contains thirty-six original articles and 23 embellishments.—"Twice Clipping the wings of Love," engraved by Mr. Sartain, is superbly rich. The continuation of "Scenes in the Life of our Saviour," by Dr. John Todd, are exceedingly interesting and suggestive. For intrinsic merit this serial has no superior.

Peterson's Ladies' National Magazine, for March, is a good number. "The Wreck" is a sterling picture. "We School Boys" is life-like and interesting. The contributions are excellent, and are from some of our first authors.

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Any person sending us three subscribers will be entitled to a copy of the "History of Propellers and Steam Navigation," re-published in book form—having first appeared in a series of articles published in the fifth Volume of the Scientific American. It is one of the most complete works upon the subject ever issued, and contains about ninety engravings—price 75 cents.

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